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Vol. 1132 Number 1

OFFICIAL GAZETTE

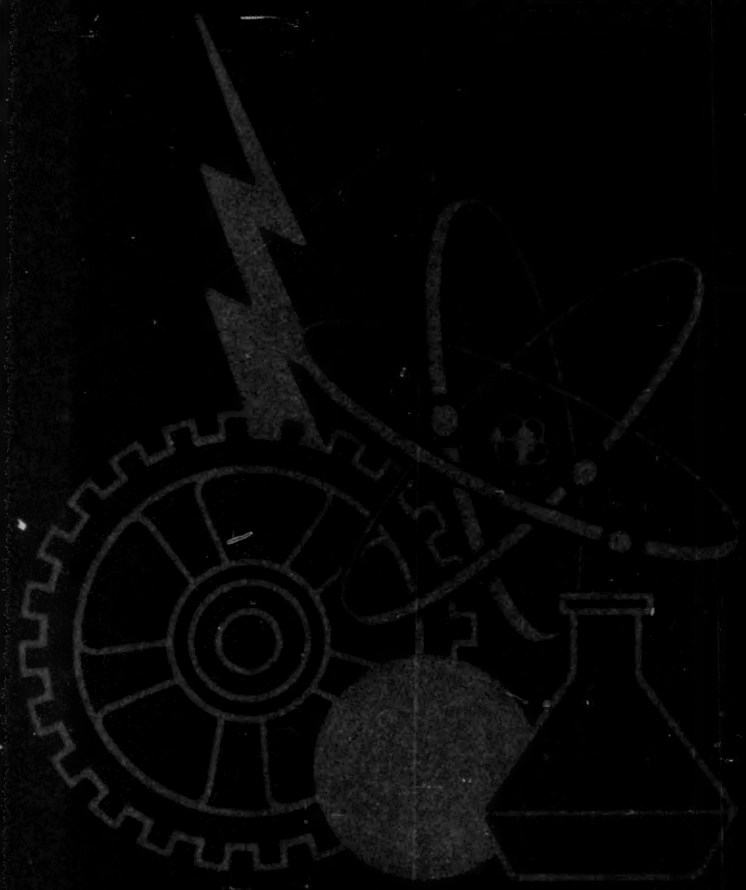
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

November 5, 1991



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on August 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc, and were announced in the *Official Gazette* at 1128 O.G. 46, on July 23, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	490.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	119.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	150.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

June 27, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on November 1, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,780,911 through 4,782,533
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 30, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,479,267 through 4,480,338
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 25, 1991
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,399,574	06/222,921	8/23/83
4,399,575	06/250,733	8/23/83
4,399,576	06/235,222	8/23/83
4,399,577	06/308,914	8/23/83
4,399,580	06/278,626	8/23/83
4,399,585	06/291,102	8/23/83
4,399,607	06/306,672	8/23/83
4,399,608	06/333,638	8/23/83
4,399,609	06/333,763	8/23/83
4,399,615	06/265,688	8/23/83
4,399,626	06/230,534	8/23/83
4,399,628	06/221,379	8/23/83
4,399,630	06/233,978	8/23/83
4,399,631	06/248,955	8/23/83
4,399,634	06/315,718	8/23/83
4,399,645	06/216,320	8/23/83
4,399,654	06/350,326	8/23/83
4,399,657	06/368,403	8/23/83
4,399,663	06/325,609	8/23/83
4,399,666	06/319,739	8/23/83
4,399,667	06/383,423	8/23/83
4,399,672	06/286,780	8/23/83
4,399,677	06/319,822	8/23/83
4,399,681	06/231,132	8/23/83
4,399,682	06/257,163	8/23/83
4,399,684	06/325,262	8/23/83
4,399,688	06/264,512	8/23/83
4,399,695	06/315,089	8/23/83
4,399,724	06/231,598	8/23/83
4,399,738	06/220,837	8/23/83
4,399,743	06/311,615	8/23/83
4,399,744	06/303,156	8/23/83
4,399,745	06/229,768	8/23/83
4,399,747	06/281,229	8/23/83
4,399,762	06/284,447	8/23/83
4,399,765	06/300,417	8/23/83
4,399,766	06/274,390	8/23/83
4,399,767	06/386,656	8/23/83
4,399,768	06/318,418	8/23/83
4,399,775	06/371,759	8/23/83
4,399,776	06/371,760	8/23/83
4,399,778	06/340,507	8/23/83
4,399,779	06/286,181	8/23/83
4,399,783	06/356,014	8/23/83
4,399,784	06/255,173	8/23/83
4,399,785	06/296,193	8/23/83
4,399,793	06/361,681	8/23/83
4,399,794	06/316,340	8/23/83
4,399,799	06/342,729	8/23/83
4,399,801	06/310,706	8/23/83
4,399,803	06/290,209	8/23/83
4,399,806	06/256,319	8/23/83
4,399,810	06/314,533	8/23/83
4,399,828	06/316,079	8/23/83
4,399,832	06/265,470	8/23/83
4,399,838	06/242,482	8/23/83
4,399,839	06/420,949	8/23/83
4,399,844	06/371,255	8/23/83
4,399,848	06/319,804	8/23/83
4,399,857	06/291,950	8/23/83
4,399,867	06/263,625	8/23/83
4,399,882	06/280,431	8/23/83
4,399,884	06/300,228	8/23/83
4,399,901	06/252,285	8/23/83
4,399,907	06/251,066	8/23/83
4,399,912	06/257,169	8/23/83
4,399,917	06/272,529	8/23/83
4,399,926	06/373,223	8/23/83
4,399,936	06/315,112	8/23/83
4,399,937	06/318,200	8/23/83
4,399,947	06/312,093	8/23/83
4,399,956	06/308,397	8/23/83
4,399,960	06/224,950	8/23/83
4,399,964	06/229,115	8/23/83
4,399,978	06/352,810	8/23/83
4,399,981	06/306,393	8/23/83
4,399,982	06/330,507	8/23/83
4,399,984	06/346,530	8/23/83
4,399,994	06/304,529	8/23/83
4,399,995	06/273,388	8/23/83
4,399,998	06/334,740	8/23/83
4,400,002	06/262,092	8/23/83
4,400,003	06/236,228	8/23/83

Patent Number	Serial Number	Issue Date
4,400,005	06/289,055	8/23/83
4,400,006	06/303,903	8/23/83
4,400,012	06/298,192	8/23/83
4,400,014	06/319,897	8/23/83
4,400,015	06/270,010	8/23/83
4,400,020	06/291,821	8/23/83
4,400,021	06/290,281	8/23/83
4,400,024	06/288,712	8/23/83
4,400,029	06/308,377	8/23/83
4,400,035	06/251,356	8/23/83
4,400,037	06/281,570	8/23/83
4,400,039	06/244,787	8/23/83
4,400,042	06/337,598	8/23/83
4,400,044	06/246,855	8/23/83
4,400,047	06/283,202	8/23/83
4,400,051	06/255,090	8/23/83
4,400,066	06/270,590	8/23/83
4,400,081	06/285,057	8/23/83
4,400,087	06/262,895	8/23/83
4,400,092	06/272,944	8/23/83
4,400,095	06/434,020	8/23/83
4,400,103	06/232,598	8/23/83
4,400,104	06/333,598	8/23/83
4,400,109	06/220,922	8/23/83
4,400,110	06/318,497	8/23/83
4,400,111	06/239,117	8/23/83
4,400,112	06/336,415	8/23/83
4,400,116	06/228,238	8/23/83
4,400,124	06/268,187	8/23/83
4,400,126	06/292,612	8/23/83
4,400,128	06/256,125	8/23/83
4,400,130	06/276,176	8/23/83
4,400,133	06/300,591	8/23/83
4,400,145	06/246,099	8/23/83
4,400,153	06/323,818	8/23/83
4,400,160	06/318,935	8/23/83
4,400,162	06/365,596	8/23/83
4,400,171	06/368,217	8/23/83
4,400,172	06/368,169	8/23/83
4,400,176	06/371,624	8/23/83
4,400,177	06/342,055	8/23/83
4,400,184	06/346,190	8/23/83
4,400,189	06/348,981	8/23/83
4,400,191	06/403,847	8/23/83
4,400,194	06/347,668	8/23/83
4,400,199	06/316,305	8/23/83
4,400,207	06/377,035	8/23/83
4,400,213	06/231,085	8/23/83
4,400,217	06/337,687	8/23/83
4,400,222	06/274,276	8/23/83
4,400,223	06/294,908	8/23/83
4,400,226	06/429,731	8/23/83
4,400,229	06/326,961	8/23/83
4,400,231	06/220,273	8/23/83
4,400,232	06/319,638	8/23/83
4,400,237	06/232,217	8/23/83
4,400,238	06/373,113	8/23/83
4,400,241	06/285,307	8/23/83
4,400,246	06/392,840	8/23/83
4,400,252	06/282,648	8/23/83
4,400,254	06/339,865	8/23/83
4,400,258	06/358,529	8/23/83
4,400,269	06/265,796	8/23/83
4,400,273	06/310,282	8/23/83
4,400,283	06/294,590	8/23/83
4,400,285	06/367,728	8/23/83
4,400,286	06/225,417	8/23/83
4,400,294	06/439,946	8/23/83
4,400,300	06/256,384	8/23/83
4,400,315	06/459,937	8/23/83
4,400,319	06/305,305	8/23/83
4,400,321	06/274,338	8/23/83
4,400,330	06/403,239	8/23/83
4,400,332	06/328,131	8/23/83
4,400,336	06/314,251	8/23/83
4,400,348	06/222,351	8/23/83
4,400,369	06/369,944	8/23/83
4,400,382	06/244,361	8/23/83
4,400,393	06/246,938	8/23/83
4,400,395	06/349,809	8/23/83
4,400,396	06/337,100	8/23/83
4,400,397	06/337,121	8/23/83
4,400,398	06/365,473	8/23/83
4,400,402	06/350,524	8/23/83
4,400,404	06/330,181	8/23/83
4,400,425	06/329,934	8/23/83
4,400,440	06/222,014	8/23/83
4,400,451	06/259,917	8/23/83
4,400,454	06/399,090	8/23/83
4,400,456	06/295,036	8/23/83
4,400,457	06/322,758	8/23/83
4,400,458	06/302,286	8/23/83
4,400,462	06/268,776	8/23/83
4,400,469	06/273,365	8/23/83
4,400,485	06/297,175	8/23/83
4,400,489	06/323,763	8/23/83
4,400,492	06/247,123	8/23/83
4,400,495	06/296,279	8/23/83
4,400,506	06/314,994	8/23/83
4,400,510	06/304,293	8/23/83
4,400,525	06/322,205	8/23/83
4,400,528	06/372,499	8/23/83
4,400,532	06/284,584	8/23/83
4,400,541	06/344,718	8/23/83
4,400,549	06/324,277	8/23/83
4,400,561	06/329,480	8/23/83
4,400,565	06/372,494	8/23/83
4,400,568	06/368,920	8/23/83
4,400,572	06/326,027	8/23/83
4,400,578	06/243,213	8/23/83
4,400,583	06/282,051	8/23/83
4,400,584	06/365,811	8/23/83
4,400,585	06/227,901	8/23/83
4,400,586	06/301,756	8/23/83
4,400,591	06/284,585	8/23/83
4,400,593	06/242,385	8/23/83
4,400,612	06/261,003	8/23/83
4,400,620	06/312,653	8/23/83
4,400,637	06/252,048	8/23/83
4,400,642	06/397,281	8/23/83
4,400,645	06/280,682	8/23/83
4,400,647	06/295,877	8/23/83
4,400,652	06/373,834	8/23/83
4,400,668	06/275,356	8/23/83
4,400,678	06/258,812	8/23/83
4,400,686	06/285,693	8/23/83
4,400,691	06/289,375	8/23/83
4,400,693	06/326,637	8/23/83
4,400,697	06/275,277	8/23/83
4,400,701	06/227,770	8/23/83
4,400,706	06/287,686	8/23/83
4,400,707	06/290,654	8/23/83
4,400,712	06/234,453	8/23/83
4,400,724	06/271,062	8/23/83
4,400,727	06/325,610	8/23/83
4,400,734	06/315,762	8/23/83
4,400,753	06/275,543	8/23/83
4,400,759	06/381,833	8/23/83
4,400,760	06/381,834	8/23/83
4,400,778	06/328,038	8/23/83
4,400,784	06/238,392	8/23/83
4,400,786	06/215,893	8/23/83
4,400,792	06/225,798	8/23/83
4,400,798	06/282,367	8/23/83
4,400,802	06/231,005	8/23/83
4,400,803	06/267,168	8/23/83
4,400,805	06/257,840	8/23/83
4,400,807	06/321,761	8/23/83
4,400,815	06/342,854	8/23/83
4,400,816	06/372,150	8/23/83
4,400,817	06/221,190	8/23/83
4,400,823	06/273,238	8/23/83
4,400,827	06/321,066	8/23/83
4,688,275	06/904,029	8/25/87
4,688,284	06/871,320	8/25/87
4,688,287	06/833,890	8/25/87

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4,688,292	06/887,313	8/25/87
4,688,296	06/756,983	8/25/87
4,688,303	06/870,498	8/25/87
4,688,309	06/816,083	8/25/87
4,688,313	06/814,239	8/25/87
4,688,316	06/863,453	8/25/87
4,688,318	06/597,255	8/25/87
4,688,330	06/824,777	8/25/87
4,688,331	06/886,019	8/25/87
4,688,333	06/898,102	8/25/87
4,688,335	06/830,320	8/25/87
4,688,339	06/934,266	8/25/87
4,688,341	06/772,325	8/25/87
4,688,342	06/785,602	8/25/87
4,688,343	06/779,938	8/25/87
4,688,345	06/803,113	8/25/87
4,688,349	06/782,094	8/25/87
4,688,350	06/892,142	8/25/87
4,688,351	05/910,634	8/25/87
4,688,353	06/871,680	8/25/87
4,688,356	06/874,165	8/25/87
4,688,357	06/852,649	8/25/87
4,688,359	06/806,455	8/25/87
4,688,365	06/861,455	8/25/87
4,688,374	06/837,906	8/25/87
4,688,377	06/742,969	8/25/87
4,688,379	06/836,854	8/25/87
4,688,383	06/736,797	8/25/87
4,688,394	06/874,668	8/25/87
4,688,395	06/881,386	8/25/87
4,688,398	06/933,348	8/25/87
4,688,400	06/808,165	8/25/87
4,688,404	06/823,192	8/25/87
4,688,405	06/689,573	8/25/87
4,688,408	06/912,084	8/25/87
4,688,414	06/924,874	8/25/87
4,688,417	06/843,018	8/25/87
4,688,421	06/785,281	8/25/87
4,688,422	06/901,113	8/25/87
4,688,439	06/723,731	8/25/87
4,688,446	06/939,380	8/25/87
4,688,457	06/787,701	8/25/87
4,688,458	06/741,669	8/25/87
4,688,459	06/797,842	8/25/87
4,688,460	06/768,446	8/25/87
4,688,461	06/927,292	8/25/87
4,688,469	06/789,456	8/25/87
4,688,479	06/816,446	8/25/87
4,688,489	06/822,423	8/25/87
4,688,492	06/934,375	8/25/87
4,688,496	06/888,639	8/25/87
4,688,504	06/809,431	8/25/87
4,688,519	06/888,284	8/25/87
4,688,520	06/833,543	8/25/87
4,688,531	06/882,894	8/25/87
4,688,532	06/738,722	8/25/87
4,688,542	06/768,696	8/25/87
4,688,543	06/838,909	8/25/87
4,688,544	06/874,560	8/25/87
4,688,545	06/895,592	8/25/87
4,688,549	06/903,685	8/25/87
4,688,561	06/776,772	8/25/87
4,688,567	06/822,225	8/25/87
4,688,571	06/874,615	8/25/87
4,688,580	06/753,824	8/25/87
4,688,581	06/913,308	8/25/87
4,688,584	06/829,117	8/25/87
4,688,587	06/549,761	8/25/87
4,688,592	06/935,347	8/25/87
4,688,598	06/721,245	8/25/87
4,688,603	06/821,348	8/25/87
4,688,613	06/891,606	8/25/87
4,688,618	06/827,463	8/25/87
4,688,623	06/554,752	8/25/87
4,688,630	06/945,058	8/25/87
4,688,633	06/844,081	8/25/87
4,688,635	06/739,113	8/25/87
4,688,651	06/910,572	8/25/87
4,688,657	06/783,334	8/25/87
4,688,665	06/858,153	8/25/87
4,688,672	06/807,752	8/25/87
4,688,679	06/776,415	8/25/87
4,688,683	06/905,637	8/25/87
4,688,684	06/816,813	8/25/87
4,688,686	06/847,182	8/25/87
4,688,688	06/767,255	8/25/87
4,688,695	06/787,268	8/25/87
4,688,696	06/801,742	8/25/87
4,688,697	06/713,124	8/25/87
4,688,699	06/783,297	8/25/87
4,688,700	06/842,293	8/25/87
4,688,704	06/616,470	8/25/87
4,688,709	06/764,670	8/25/87
4,688,712	06/800,169	8/25/87
4,688,714	06/640,768	8/25/87
4,688,723	06/821,379	8/25/87
4,688,725	06/811,536	8/25/87
4,688,731	06/785,480	8/25/87
4,688,739	06/889,660	8/25/87
4,688,743	06/709,872	8/25/87
4,688,744	06/414,730	8/25/87
4,688,746	06/668,502	8/25/87
4,688,749	06/812,180	8/25/87
4,688,761	06/888,344	8/25/87
4,688,762	06/878,614	8/25/87
4,688,770	06/821,749	8/25/87
4,688,781	06/649,503	8/25/87
4,688,783	06/713,451	8/25/87
4,688,789	06/808,549	8/25/87
4,688,792	06/870,801	8/25/87
4,688,793	06/863,468	8/25/87
4,688,796	06/786,349	8/25/87
4,688,797	06/805,814	8/25/87
4,688,799	06/806,875	8/25/87
4,688,815	06/593,835	8/25/87
4,688,816	06/934,480	8/25/87
4,688,822	06/683,685	8/25/87
4,688,827	06/875,544	8/25/87
4,688,828	06/847,277	8/25/87
4,688,829	06/903,383	8/25/87
4,688,838	06/835,748	8/25/87
4,688,841	06/872,553	8/25/87
4,688,842	06/800,120	8/25/87
4,688,843	06/836,081	8/25/87
4,688,845	06/915,093	8/25/87
4,688,852	06/882,145	8/25/87
4,688,853	06/824,267	8/25/87
4,688,855	06/823,112	8/25/87
4,688,856	06/791,686	8/25/87
4,688,862	06/730,294	8/25/87
4,688,867	06/818,147	8/25/87
4,688,874	06/827,761	8/25/87
4,688,886	06/765,950	8/25/87
4,688,890	06/710,461	8/25/87
4,688,892	06/713,151	8/25/87
4,688,905	06/719,801	8/25/87
4,688,935	06/507,597	8/25/87
4,688,937	06/699,533	8/25/87
4,688,943	06/848,815	8/25/87
4,688,959	06/783,461	8/25/87
4,688,960	06/880,436	8/25/87
4,688,962	06/843,547	8/25/87
4,688,963	06/854,014	8/25/87
4,688,965	06/866,907	8/25/87
4,688,968	06/872,183	8/25/87
4,688,970	06/763,936	8/25/87
4,688,971	06/567,542	8/25/87
4,688,976	06/839,257	8/25/87
4,688,981	06/771,907	8/25/87
4,688,984	06/767,583	8/25/87
4,688,985	06/737,493	8/25/87
4,688,994	06/919,614	8/25/87
4,688,996	06/822,183	8/25/87
4,689,001	06/726,405	8/25/87
4,689,002	06/818,810	8/25/87
4,689,003	06/741,517	8/25/87

Patent Number	Serial Number	Issue Date
4,689,012	06/844,454	8/25/87
4,689,013	06/839,218	8/25/87
4,689,019	06/696,116	8/25/87
4,689,029	06/842,282	8/25/87
4,689,031	06/869,543	8/25/87
4,689,032	06/802,925	8/25/87
4,689,033	06/826,855	8/25/87
4,689,034	06/827,335	8/25/87
4,689,035	06/752,291	8/25/87
4,689,038	06/827,571	8/25/87
4,689,047	06/832,362	8/25/87
4,689,050	06/811,379	8/25/87
4,689,051	06/867,668	8/25/87
4,689,057	06/896,043	8/25/87
4,689,068	06/825,387	8/25/87
4,689,117	06/772,575	8/25/87
4,689,119	06/606,800	8/25/87
4,689,126	06/673,937	8/25/87
4,689,132	06/833,134	8/25/87
4,689,134	06/886,585	8/25/87
4,689,135	06/833,357	8/25/87
4,689,139	06/832,936	8/25/87
4,689,142	06/714,832	8/25/87
4,689,145	06/892,047	8/25/87
4,689,154	06/798,508	8/25/87
4,689,156	06/796,824	8/25/87
4,689,165	06/849,500	8/25/87
4,689,174	06/916,844	8/25/87
4,689,175	06/896,399	8/25/87
4,689,177	06/919,119	8/25/87
4,689,187	06/702,100	8/25/87
4,689,204	06/709,595	8/25/87
4,689,209	06/884,470	8/25/87
4,689,219	06/618,239	8/25/87
4,689,224	06/905,447	8/25/87
4,689,227	06/890,248	8/25/87
4,689,228	06/769,533	8/25/87
4,689,230	06/561,527	8/25/87
4,689 232	06/785,181	8/25/87
4,689,233	06/816,253	8/25/87
4,689,234	06/794,484	8/25/87
4,689,238	06/662,971	8/25/87
4,689,249	06/819,505	8/25/87
4,689,255	06/916,688	8/25/87
4,689,262	06/775,386	8/25/87
4,689,269	06/722,663	8/25/87
4,689,276	06/695,426	8/25/87
4,689,282	06/815,965	8/25/87
4,689,327	06/748,394	8/25/87
4,689,335	06/570,585	8/25/87
4,689,337	06/714,857	8/25/87
4,689,343	06/853,826	8/25/87
4,689,346	06/791,934	8/25/87
4,689,361	06/841,639	8/25/87
4,689,366	06/808,364	8/25/87
4,689,367	06/837,930	8/25/87
4,689,375	06/777,901	8/25/87
4,689,385	06/870,991	8/25/87
4,689,418	06/339,528	8/25/87
4,689,421	06/641,152	8/25/87
4,689,425	06/927,477	8/25/87
4,689,428	06/901,633	8/25/87
4,689,430	06/931,606	8/25/87
4,689,448	06/764,835	8/25/87
4,689,451	06/833,956	8/25/87
4,689,454	06/751,057	8/25/87
4,689,458	06/887,726	8/25/87
4,689,461	06/780,031	8/25/87
4,689,464	06/698,935	8/25/87
4,689,469	06/731,972	8/25/87
4,689,472	06/752,448	8/25/87
4,689,476	06/651,601	8/25/87
4,689,492	06/891,969	8/25/87
4,689,520	06/755,331	8/25/87
4,689,523	06/698,554	8/25/87
4,689,524	06/784,287	8/25/87
4,689,527	06/749,180	8/25/87
4,689,531	06/750,584	8/25/87
4,689,532	06/731,387	8/25/87
4,689,536	06/835,726	8/25/87
4,689,543	06/813,996	8/25/87
4,689,548	06/851,850	8/25/87
4,689,551	06/772,798	8/25/87
4,689,553	06/722,711	8/25/87
4,689,554	06/772,724	8/25/87
4,689,555	06/837,813	8/25/87
4,689,573	06/767,638	8/25/87
4,689,584	06/801,536	8/25/87
4,689,585	06/801,534	8/25/87
4,689,598	06/930,152	8/25/87
4,689,611	06/731,937	8/25/87
4,689,612	06/776,681	8/25/87
4,689,613	06/741,106	8/25/87
4,689,614	06/810,329	8/25/87
4,689,620	06/761,619	8/25/87
4,689,629	06/424,834	8/25/87
4,689,632	06/739,429	8/25/87
4,689,634	06/718,156	8/25/87
4,689,637	06/737,479	8/25/87
4,689,650	06/783,702	8/25/87
4,689,675	06/737,247	8/25/87
4,689,705	06/855,521	8/25/87
4,689,714	06/854,625	8/25/87
4,689,719	06/724,491	8/25/87
4,689,720	06/824,834	8/25/87
4,689,732	06/759,139	8/25/87
4,689,734	06/872,894	8/25/87
4,689,753	06/744,026	8/25/87
4,689,757	06/810,532	8/25/87
4,689,761	06/641,162	8/25/87
4,689,774	06/760,578	8/25/87
4,689,791	06/773,618	8/25/87
4,689,794	06/695,658	8/25/87
4,689,798	06/891,019	8/25/87
4,689,810	06/702,161	8/25/87
4,689,811	06/857,746	8/25/87
4,689,813	06/670,611	8/25/87
4,689,814	06/868,775	8/25/87

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,331,576	06/229,467	5/25/82	1/29/81	4/29/91
4,623,679	06/744,224	11/18/86	6/13/85	9/20/91
4,623,668	06/614,142	11/18/86	5/25/84	9/20/91
4,623,942	06/734,182	11/18/86	5/15/85	9/20/91
4,624,423	06/734,181	11/25/86	5/15/85	9/20/91
4,625,252	06/411,606	11/25/86	8/25/82	9/20/91

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,641,848	06/723,370	2/10/87	4/15/85	9/20/91
4,648,594	06/690,991	3/10/87	1/14/85	9/13/91
4,669,405	06/653,794	6/02/87	9/24/84	9/13/91

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,790,266, Re. S.N. 07/619,957, Filed Nov. 30, 1991, Cl. 119/515, FEEDER FOR ANIMALS, Jonathan R. Kleinsasser, et. al., Owner of Record: *Gro- Master Feeds Inc., Omaha, Nebr.*, Attorney or Agent: Dennis L. Thomte, Ex. Gp.: 333

4,800,442, Re. S.N. 07/645,398, Filed Jan. 24, 1991, Cl. 358/459, APPARATUS FOR GENERATING AN IMAGE FROM A DIGITAL VIDEO SIGNAL, John H. Riseman, et. al., Owner of Record: *Inventor*, Attorney or Agent: Ronald A. Clayton, Ex. Gp.: 268

4,809,070, Re. S.N. 07/756,259, Filed Sept. 3, 1991, Cl. 358/166, METHOD AND APPARATUS FOR ADDING TEXTURING HIGHLIGHTS TO A VIDEO SIGNAL, Drake E. Lake, Owner of Record: *The Grass Valley Group, Inc., Grass Valley, Calif.*, Attorney or Agent: Francis I. Gray, Ex. Gp.: 262

4,848,803, Re. S.N. 07/732,058, Filed July 18, 1991, Cl. 285/47, FABRIC EXPANSION JOINTS FOR EXHAUST SYSTEMS OF GAS TURBINES, Lothar Bachman, Owner of Record: *Bachman Industries, Inc., Lewiston, Me.*, Attorney or Agent: G. Roger Lee, Ex. Gp.: 351

4,869,027, Re. S.N. 07/765,306, Filed Sept. 25, 1991, Cl. 51/204, KNIFE HOLDING AND SHARPENING CASETTE AND KNIVES THEREFOR, John B. McEvily, Owner of Record: *McPherson's America Inc., Farmingdale, N.Y.*, Attorney or Agent: Edward S. Irons. Ex. Gp.: 323

4,869,408, Re. S.N. 07/765,221, Filed Sept. 23, 1991, Cl. 224/32A, BICYCLIST'S HAND-PORTABLE RACK-MOUNTING GARMENT-PACK W/PANNIERS, Raymond Clark Lutz, Owner of Record: *Inventor*, Attorney or Agent: none Ex. Gp.: 243

4,869,807, Re. S.N. 07/764,599, Filed Sept. 24, 1991, Cl. 208/120, GASOLINE OCTANE ENHANCEMENT IN FLUID CATALYTIC CRACKING PROCESS WITH SPLIT FEED INJECTION TO RISER REACTOR, Ashok S. Krishna, Owner of Record: *Chevron Research Co., San Francisco, Calif.*, Attorney or Agent: Allen H. Uzzell, Ex. Gp.: 119

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,847,399, Reexam No. 90/002,462, Requested Oct. 4, 1991, Cl. 273/167F, GOLF CLUB WITH UNIT-CELL HEAD CONSTRUCTION, William R. Raymont, Owner of Record: *Dillis V. Allen, Elk Grove Village, Ill.*, Attorney or Agent: John Holtrichter, Jr., Redondo Beach, Calif., Ex. Gp.: 334, Requester: Dunlop Slazenger Corp., Greenville, S.C.

4,226,737, Reexam No. 90/002,451, Requested Sept. 18, 1991, Cl. 252/182.13, POLYCYCLOALIPHATIC POLYAMINES, Edward W. Kluger, et. al., Owner of Record: *Milliken Research Corp., Spartanburg, S.C.*, Attorney or Agent: H. William Petry and Terry T. Moyer, Milliken Research Corp., Spartanburg, S.C., Ex. Gp.: 224, Requester: Russell L. Brewer, Air Products and Chemicals, Inc., Allentown, Pa.

4,307,320, Reexam No. 90/002,460, Requested Sept. 6, 1991, Cl. 313/474, PIGMENT COATED PHOSPHOR AND HIGH CONTRAST COLOR TELEVISION CATHODE RAY TUBE USING SAME, Noboru Kotera, et. al., Owner of Record: *Kasei Optonix, Ltd., Tokyo, Japan*, Attorney or Agent: Charles E. Miller, Pennie & Edmonds, New York, N.Y., Ex. Gp.: 264, Requester: Nichia America Corp., Lancaster, Pa.

4,321,353, Reexam No. 90/002,452, Requested Sept. 18, 1991, Cl. 528/120, POLYCYCLOALIPHATIC POLYAMINES, Edward W. Kluger, et. al., Owner of Record: *Milliken Research Corp., Spartanburg, S.C.*, Attorney or Agent: H. William Petry and/or Terry T. Moyer, Milliken Research Corp., Spartanburg, S.C., Ex. Gp.: 153, Requester: Russell L. Brewer, Air Products and Chemicals, Allentown, Pa.

4,381,458, Reexam No. 90/002,461, Requested Sept. 30, 1991, Cl. 307/066, BACK-UP ELECTRICAL POWER SUPPLIES, Michael J. Anstey, et. al., Owner of Record: *Dallas Semiconductor Corp., Dallas, Tex.*, Attorney or Agent: Carlton H. Hoel, Worsham, Forsythe, Sampels & Woolridge, Dallas, Tex., Ex. Gp.: 214, Requester: Owner

4,387,415, Reexam No. 90/002,450, Requested Sept. 30, 1991, Cl. 362/074, CORNICE LIGHTING FIXTURE, Ben V. Domas, Owner of Record: *Transmatic Inc., Waterford, Mich.*, Attorney or Agent: James A. Kushman, Brooks & Kushman, Southfield, Mich, Ex. Gp.: 346, Requester: Morris Relson, Darby & Darby, New York, N.Y.

4,513,743, Reexam No. 90/002,453, Requested Sept. 26, 1991, Cl. 128/419PG, PHYSIOLOGICAL DEVICES SUCH AS PACEMAKERS AND METHOD FOR PROVIDING HISTOGRAM DATA, Gerrit W. Van Arragon, Owner of Record: *Viatron Medical B. V., Dieren, The Netherlands*, Attorney or Agent: Albert W. Preston, Jr., Woodcock, Washburn, Kurtz, Mackiewicz & Norris, Philadelphia, Pa., Ex. Gp.: 335, Requester: Owner

4,652,630, Reexam No. 90/002,454, Requested Sept. 26, 1991, Cl. 530/344, METHOD OF SOMATOTROPIN NATURATION, Larry A. Bentle, et. al., Owner of Record: *Monsanto Co., St. Louis, Mo.*, Attorney or Agent: Wayne R. Eberhardt & George R. Beck, Monsanto Co., St. Louis, Mo., Ex. Gp.: 186, Requester: Owner

4,816,455, Reexam No. 90/002,455, Requested Sept. 27, 1991, Cl. 514/254, CRYSTALLINE ANHYDROUS SIGMAFORM OF 2-(4-(2-FUROYL)-(2-PIPERAZIN)-1-YL)-4-AMINO-6, 7-DIMETHOXY-QUINAZOLINE HYDROCHLORIDE AND A PROCESS FOR ITS PREPARATION, Helmut Schickaneder, et. al., Owner of Record: *Heumann Pharma GmbH & Co., Nuremberg, Federal Republic of Germany*, Attorney or Agent: Norman H. Stepno, Burns, Doane, Swecker & Mathis, Alexandria, Va., Ex. Gp.: 125, Requester: James C. Lydon, Armstrong Nikaido, Marmelstein Kubovcik & Murray, Washington, DC

4,916,250, Reexam No. 90/002,463, Requested Oct. 4, 1991, Cl. 558/217, PHOSPHONATE REAGENT COMPOSITIONS, James H. Babler, Owner of Record: *Loyola University of Chicago, Chicago, Ill.*, Attorney or Agent: Marshall, O'Toole, Gerstein, Murray & Bicknell, Chicago, Ill., Ex. Gp.: 121, Requester: Owner

Notice of Exclusion

In Disciplinary Proceeding D91-9, Edmund Francis Bard III of Houston, Tex., whose registration number is 20,094, has been excluded, as of Sept. 22, 1991, from practice in patent, trademark and other non-patent law before the Patent and Trademark Office. Inasmuch as there has been no appeal to the Commissioner, this action is taken under the provisions of 35 U.S.C. 32 and 37 CFR 10.154(a).

Oct. 8, 1991

CAMERON WEIFFENBACH,
Director, Office of
Enrollment and Discipline

PATENT NOTICES

Certificates of Correction For Week of October 29, 1991

4,704,724	4,888,757	4,921,777	4,940,772
4,722,875	4,889,663	4,922,203	4,940,814
4,741,891	4,891,118	4,922,348	4,940,977
4,746,990	4,894,740	4,922,535	4,941,304
4,762,708	4,894,822	4,922,617	4,941,316
4,763,251	4,897,107	4,922,967	4,941,557
4,786,014	4,897,419	4,923,177	4,941,967
4,786,600	4,897,874	4,924,842	4,942,142
4,789,690	4,898,317	4,925,390	4,942,502
4,790,081	4,898,896	4,925,456	4,942,653
4,813,952	4,899,284	4,926,041	4,943,832
4,816,584	4,899,535	4,927,469	4,944,196
4,826,778	4,905,168	4,927,721	4,944,516
4,839,804	4,906,158	4,927,923	4,944,650
4,849,614	4,908,403	4,929,997	4,945,140
4,850,749	4,909,105	4,930,204	4,945,354
4,854,993	4,909,399	4,930,412	4,945,529
4,855,466	4,909,531	4,930,613	4,945,531
4,857,432	4,910,031	4,931,401	4,946,116
4,857,991	4,910,226	4,931,574	4,946,768
4,859,485	4,910,683	4,931,802	4,947,209
4,860,898	4,910,731	4,931,868	4,947,226
4,861,581	4,911,423	4,932,000	4,947,646
4,861,761	4,912,011	4,932,071	4,947,945
4,861,945	4,912,116	4,932,209	4,948,213
4,866,110	4,912,157	4,932,416	4,948,367
4,866,278	4,912,643	4,934,474	4,948,672
4,869,110	4,912,910	4,934,983	4,949,818
4,872,570	4,913,209	4,935,358	4,950,691
4,873,082	4,914,122	4,927,230	4,950,763
4,873,227	4,915,713	4,938,372	4,952,287
4,873,244	4,916,592	4,938,563	4,954,204
4,877,509	4,917,645	4,938,842	4,960,436
4,878,725	4,917,708	4,939,070	4,976,871
4,879,106	4,917,858	4,939,094	4,981,351
4,879,471	4,917,919	4,939,293	4,988,260
4,879,874	4,917,958	4,939,321	4,999,263
4,882,202	4,918,266	4,939,758	5,027,117
4,883,806	4,919,836	4,939,773	5,031,324
4,886,526	4,920,194	4,939,785	5,035,354
4,886,705	4,920,244	4,939,821	5,036,272
4,887,079	4,920,613	4,940,148	5,040,087
4,887,467	4,920,913	4,940,200	
4,887,904	4,921,105	4,840,446	

Erratum

4,959,682-Takemi Yamamoto, Ryohei Koniyi, both of Nagoya; Naoyuki Hatta, Gamagori; Ymio Matsumoto, Kasugai; Fumihiro Sunda, Nagoya, all of Japan. COPYING APPARATUS. In the notice of Disclaimer appearing at 1126 OG 22 in the *OFFICIAL GAZETTE* of May 14, 1991, the entire term of said patent was erroneously disclaimed and should be corrected to read as follows: this patent subsequent to Sept. 26, 2006 has been disclaimed.

Disclaimers

4,601,875—*Hitoshi Yamamoto, Osaka; Masato Sagawa, Nagoakakyo; Setsuo Fujimura, Kyoto; Yutaka Matsuura, Ibaraki*, all of Japan. PROCESS FOR PRODUCING MAGNETIC MATERIALS. Patent dated July 22, 1986, by the assignee, Sumitomo Special Metals Co., Ltd.

Hereby enters this disclaimer to claims 34 and 35 of said patent.

4,866,602—*John C. Hall*, Redmond, Wash. POWER SUPPLY FOR A COMPUTER PERIPHERAL DEVICE WHICH POSITIONS A CURSOR ON A COMPUTER DISPLAY. Patent dated Sept. 12, 1989. Disclaimer filed July 8, 1991, by the assignee, Microsoft Corp.

Hereby enters this disclaimer to claim 15 of said patent.

4,959,100—*Ghyslain Dube; Jean-Paul Huni, Serge Lavoie; Wesley D. Stevens*, all of Jonquiere, Canada. RECOVERY OF NON-FERROUS METALS FROM DROSS. Patent dated Sept. 25, 1990. Disclaimer filed July 25, 1991, by the assignee, Alcan International Ltd.

Hereby enters this disclaimer to claims 28, 32, 37 and 41 of said patent.

4,993,355—*Wiebe B. deBoer*, GB Eersel, Netherlands; Albert. E. Ozias, Aumsville, Oreg. SUSCEPTOR WITH TEMPERATURE SENSING DEVICE. Patent dated Feb. 19, 1991. Disclaimer filed Sept. 3, 1991, by the assignee, Epsilon Technology, Inc.

The term of this patent subsequent to February 19, 2008, has been disclaimed.

5,002,693—*Takayuki Higashii, Kishiwada; Masayoshi Minai, Moriyama*, both of Japan. NOVEL OPTICALLY ACTIVE BENZENE DERIVATIVES, PROCESS FOR PRODUCING THE SAME AND LIQUID-CRYSTALLINE SUBSTANCES CONTAINING SAID DERIVATIVES AS ACTIVE INGREDIENT AND OPTICAL SWITCHING ELEMENTS. Patent dated Mar. 26, 1991. Disclaimer filed June 6, 1991, by the assignee, Sumitomo Chemical Co. Ltd.

The term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

5,037,061—*Harvey J. Shopsky*, Latrobe, Pa. VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME. Patent dated Aug. 6, 1991. Disclaimer filed May 31, 1991, by the assignee, Robertshaw Controls Co.

The term of this patent subsequent to Sept. 25, 2007, has been disclaimed.

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PATENT EXAMINING CORPS

JAMES E. DENNY, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	6/7/90
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	11/1/90
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — BARRY S. RICHMAN, Director	308-0651	2/1/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	6/8/90
BIOTECHNOLOGY, GROUP 180 — EDWARD E. KUBASIEWICZ, Director	308-0196	2/1/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	3/8/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	1/22/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	7/8/89
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MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	10/1/90
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	12/7/90
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A. L. SMITH, Director	308-0651	10/1/90

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during October 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,838,466 to 3,845,503 inclusive
Plant Patents ..... 3,628 to 3,643

REEXAMINATIONS

NOVEMBER 5, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,229,360 (1585th)

PROCESS FOR THE DEHYDRATION OF A COLLOIDAL DISPERSION OF LIPOSOMES

Michel Schneider, Grand-Lancy, and Bernard Lamy, Carouge, both of Switzerland, assignors to Liposome Company, Inc.

Reexamination Request No. 90/002,252, Jan. 11, 1991.

Reexamination Certificate for Patent No. 4,229,360, issued Oct. 21, 1980, Ser. No. 931,243, Aug. 4, 1978.

Int. Cl.[5] A23J *7/00;* **C07F** *9/02;* **C11C** *3/00*

U.S. Cl. 260—403

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3** are determined to be patentable as amended.

Claims **4–5**, dependent on an amended claim, are determined to be patentable.

New claims **6–15** are added and determined to be patentable.

1. A process for the dehydration of a colloidal dispersion of liposomes [in an aqueous liquid medium] which comprises mixing a hydrophilic compound with the [liposome dispersion] *colloidal dispersion of the liposomes in an aqueous liquid medium,* and dehydrating the mixture to form a stable [liposome containing] powder which can be stored and reconstituted in an aqueous medium [as a liposome dispersion] *to recover the colloidal dispersion of liposomes which is suitable for administration in vivo.*

B1 4,835,182 (1586th)

ENHANCING DRUG DELIVERY TO THE BRAIN

Nigel H. Greig, Washington, D.C.; Daniel J. Sweeney, Indianapolis, Ind., and Stanley I. Rapoport, Washington, D.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Reexamination Request No. 90/002,048, Jun. 8, 1990.

Reexamination Certificate for Patent No. 4,835,182, issued May 30, 1989, Ser. No. 88,982, Aug. 21, 1987.

Int. Cl.[5] A61K *31/245;* **C07C** *101/64, 229/00*

U.S. Cl. 514—538

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

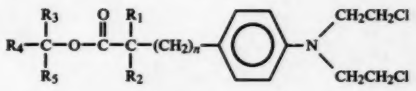
Claims **5** and **6** are cancelled.

Claims **1** and **2** are determined to be patentable as amended.

Claims **3**, **4**, **7** and **8**, dependent on an amended claim, are determined to be patentable.

New claims **9**, **10**, **11**, **12** and **13** are added and determined to be patentable.

1. A compound having the following formula:



wherein

R_1 and R_2 are the same or different and are selected from the group consisting of H, Cl, F, Br, I and R_2 may also be NH_2;

R_3, R_4, and R_5 are the same or different and are selected from the group consisting of C_1–C_3 alkyl, [H, F, Cl, Br, I]; wherein alkyl may be substituted with F, Cl, Br, or I, [with the proviso that at least two of R_3, R_4 and R_5 are alkyl or substituted alkyl]; and

n is an integer of 0–4.

B1 4,869,946 (1587th)

TAMPERPROOF SECURITY CARD

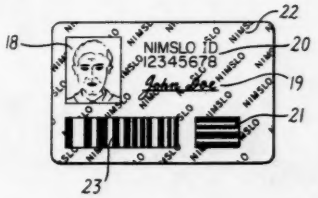
Stanton T. Clay, Alpharetta, Ga., assignor to Nimslo Corporation

Reexamination Request No. 90/002,178, Oct. 24, 1990.

Reexamination Certificate for Patent No. 4,869,946, issued Sep. 26, 1989, Ser. No. 139,191, Dec. 29, 1987.

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—167



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–7**, dependent on an amended claim, are determined to be patentable.

1. A security card comprising an image-containing substrate layer and a transparent layer overlaying said substrate, said transparent layer having a plurality of parallel uniformly-spaced lenticules on the outer surface thereof, and said image-containing layer *comprising a photographic emulsion affixed to the inner surface of said transparent layer and* having *photographically recorded thereon through the overlying lenticules* discrete data-containing bands under and parellel to a plurality of the lenticules of the lenticular layer, said lenticules and said bands positioned with respect to one another such that they function as a lenticular system wherein said discrete bands are selectively visible and not visible as at least one data-containing image when the card is viewed from different angles about an axis of rotation parallel to said lenticules, said at least one data-containing image containing imformation which distinguishes said card from otherwise similar cards and which is unique to a particular person assigned to said card.

STATUTORY INVENTION REGISTRATIONS

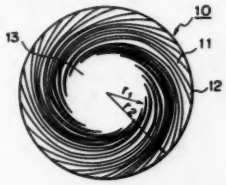
PUBLISHED NOVEMBER 5, 1991

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H974
THRUST BEARING AND METHOD OF MANUFACTURING THEREOF

Shotaro Mizobuchi, 2-20-401 Satsuki-cho, Ebina-shi, Kanagawa-Ken; Katsumi Sasaki, 5-19-9, Haneda, Ota-ku, Tokyo, and Yoshikazu Kimura, 4679-8, Kami-iida-cho, Yokohama-shi, Kanagawa-ken, all of Japan

Continuation of Ser. No. 70,824, Jul. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 627,731, Jul. 3, 1984, abandoned. This application Sep. 28, 1989, Ser. No. 414,578
Claims priority, application Japan, Jul. 6, 1983, 58-121567
Int. Cl.[5] B22F *3/24*
U.S. Cl. 29—898.041 **2 Claims**



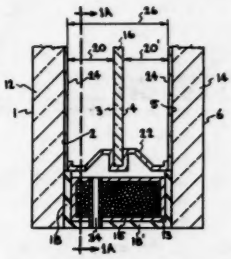
1. A method of manufacturing an element of a thrust bearing having spiral grooves thereon, comprising the steps of:
- shaping and sintering a material to form a body which is entirely of sintered ceramic and in a disk form having flat surfaces on both sides thereof and having a ratio of the outer diameter of the sintered disk to the thickness of the sintered disk which is less than or equal to 25;
- lapping at least one of said surfaces of said sintered ceramic disk;
- preparing a mask having a pattern of spiral grooves;
- placing said mask over said lapped surfaces of said sintered ceramic disk;
- directing a stream of minute abrasive particles onto said lapped surface of said sintered ceramic disk through said mask for shot blasting spiral grooves in said lapped surface;
- controlling the depth of said spiral grooves in said sintered ceramic disk to be a desired depth by operation of said shot blasting; and
- removing said mask from said lapped surface of said sintered ceramic disk;
- whereby spiral grooves are formed on said lapped surface of said sintered complete ceramic disk.

H975
THERMAL INSULATED GLAZING UNIT

Stephen E. Selkowitz, Piedmont; Dariush K. Arasteh, Oakland, both of Calif., and John L. Hartmann, Seattle, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 319,871, Mar. 1, 1989, abandoned, which is a continuation of Ser. No. 178,043, Apr. 5, 1988, abandoned. This application Oct. 30, 1989, Ser. No. 428,539
Int. Cl.[5] E06B *7/12*
U.S. Cl. 52—172 **21 Claims**

1. An insulated glazing unit for constructing thermal windows comprising:
- an outer glazing having an exterior surface and a center-facing surface,
- an inner glazing having an interior surface and a center-facing surface, said inner glazing being held parallel to and spaced away from said outer glazing such that the center-facing surface of said outer glazing and the center-facing surface of said inner glazing face each other,
- a means for sealing said inner glazing and said outer glazing together to form a gas impermeable space between said inner glazing and said outer glazing;
- at least one middle glazing held substantially parallel to,

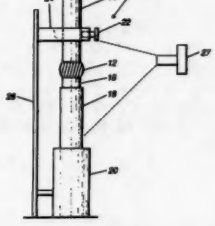


between and spaced away from said center-facing surface of said outer glazing and said center-facing surface of said inner glazing to form at least two thermal gaps;
- a low emittance coating having an emissivity of less than about 0.15 on at least one glazing surface facing each said thermal gap; and,
- a low conductance gas comprising krypton entrapped within said gas impermeable space.

H976
APPARATUS AND METHOD FOR MEASURING ELONGATIONAL VISCOSITY OF A POLYMERIC SOLUTION

Joseph E. Matta, and Raymond P. Tytus, both of Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 16, 1990, Ser. No. 495,052
Int. Cl.[5] G01N *11/02*
U.S. Cl. 73—54 **7 Claims**

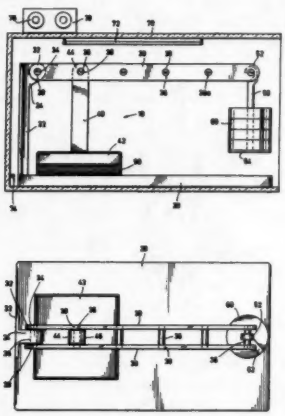


1. A falling extensional rheometer for measuring the elongational viscosity of a polymeric medium, comprising, an upper fixed means having a free end, a lower movable means having a free end, said upper fixed means and said lower movable means being vertically oriented and having their longitudinal axes substantially coincidental and their ends parallel spaced from each other, means for supporting said lower movable means and then retracted downwardly allows said lower movable means to fall and stretch a medium adhering between the ends of said upper fixed means and said lower movable means.

H977
APPARATUS AND METHOD FOR INDUCING BLOCKING IN PLASTIC FILMS UNDER KNOWN CONDITIONS

Werner Kurzbuch, Baytown; Larry J. Mitchell, and Andor Scheller, both of Houston, all of Tex., assignors to Exxon Chemical Company, Baytown, Tex.

Filed Oct. 5, 1990, Ser. No. 593,153
Int. Cl.[5] B30B *1/02*; B29G *43/22*
U.S. Cl. 100—179 **14 Claims**



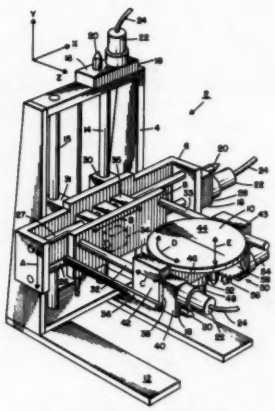
1. An apparatus useful for inducing blocking between a plurality of plastic samples comprising:
an oven;
means for controlling the temperature within said oven; and
a sample testing device for applying a known, but variable, compressive force to a plurality of plastic samples, said testing device disposed with said oven and comprising,
a base platen;
a movable platen disposed for cooperation with said base platen;
a rigid, fixed support extending above said base platen;
a lever arm, said lever arm pivotable about a pivot with respect to said support;
a plurality of weight receiving locations disposed along said lever arm; and
a thrust member for transmitting a force from said lever arm to said movable platen.

H978
HOT CELL EXAMINATION TABLE

Peter S. Gaal, Monroeville, Pa.; Lino P. Ebejer, Weston, Mass.; James H. Kareis, Slickville, and Gary L. Schlegel, McKeesport, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 27, 1990, Ser. No. 515,307
Int. Cl.[5] A47B *85/00*
U.S. Cl. 108—20 **12 Claims**

1. An examination table for use in a hostile environment having a frame, a movable table top, and means for controllably moving said table top relative to said frame, said moving means comprising:
shaft means fixedly mounted to said frame for axial rotation;
electromechanical drive means connected to said frame and said shaft means for rotating said shaft means; and
shaft travel means for traveling along said shaft means, said shaft travel means comprising a plurality of tilted rollers, means for biasing said tilted rollers against said shaft means and means for connecting said shaft travel means to said table top such that rotation of said shaft means causes said tilted rollers to frictionally roll along said shaft means

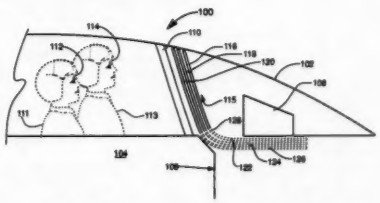


whereby said table top is moved parallel to said shaft means as said shaft means is rotated.

H979
COCKPIT VISION AND PROTECTION APPARATUS

Malcolm E. Kelley, Yellow Springs, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 2, 1990, Ser. No. 548,466
Int. Cl.[5] B64C *1/14*
U.S. Cl. 244—129.3 **12 Claims**

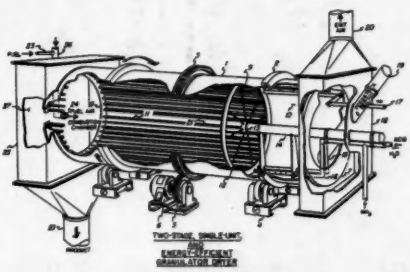


1. A protective viewing system for an aircraft cockpit comprising the combination of:
exterior windshield means including an aircraft surface merged, curved, clear thin outer windshield member disposed in front of the aircraft pilot for transparently closing the cockpit fuselage aperture of said aircraft;
heads-up display means located behind said outer windshield member and in front of said pilot for communicating selected avionics data thereto;
a thicker impact protection transparent shield member located intermediate said heads-up display means and said pilot for halting the travel of pilot threatening physical objects passing through said thin windshield member into said fuselage;
a retractably mounted first specific threat protecting selectively transparent shield member disposable between said heads-up display means and said impact protection windshield member in a first pilot protection affording use position thereof and disposable in an internal portion of the aircraft fuselage in a second storage position thereof.

H980
TWO-STAGE, SINGLE-UNIT, AND ENERGY-EFFICIENT GRANULATOR DRYER

Cecil P. Harrison, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed May 11, 1989, Ser. No. 350,274
Int. Cl.[5] B22F *3/00*; B29C *67/24*; A01N *25/00*; B01J *8/08*
U.S. Cl. 425—222 **8 Claims**



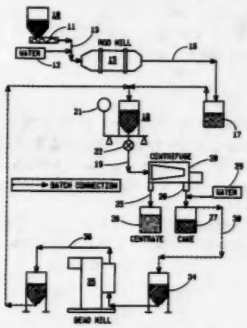
1. Apparatus for treating particulate solid material in free-flowing condition with at least two fluid reactants comprising: a rotating drum with its axis slightly inclined from the horizontal and adapted for rotation about said axis; said drum having a cylindrical side wall, including an inner peripheral surface, the lowermost portion of which comprises the bottommost position on said inner peripheral surface of said drum; and, said drum having a first longitudinal portion of its length free of lifting flights wherein is formed particulate material into a tumbling bed; said drum also having a second longitudinal portion of its length fitted with internal lifting flights extending about the whole of the length of said second drum portion for lifting and dropping particulate material in the form of free falling curtains, which curtains extend about the whole of the length of said second drum portion; a first plurality of reactant spray nozzle means in and spaced apart along the length of said first drum portion and about parallel to the axis thereof, and located near the inner peripheral surface of said drums so as to be continuously embedded in said tumbling bed for delivery of a first fluid reactant into said tumbling bed, and a second plurality of reactant spray nozzle means in and spaced apart along the length of said first drum portion and about parallel to the axis thereof, and located near the inner peripheral surface of said drum so as to be continuously embedded in said tumbling bed for delivery of a second fluid reactant into said tumbling bed; said first plurality of reactant spray nozzle means and said second plurality of reactant spray nozzle means located in a lower quadrant of said drum, when viewed in a plane perpendicular to the axis of said drum, into which a point located at the bottommost position on said inner peripheral surface of said drum would next enter; air heating and drying means for supplying heated and dried air to said second drum portion, and air moving means for providing distribution of heated and dried air removed from said air heating and drying means and introduced into intimate contact with said curtains of particulate material in said second portion of said drum prior to contact of said air with said particulate material in said tumbling bed in said first portion of said drum.

H981
PROCESS FOR SELECTIVE GRINDING OF COAL

Mukund K. Venkatachari, San Francisco; August D. Benz, Hillsborough, and Horst Huettenhain, Benicia, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 25, 1989, Ser. No. 398,576
Int. Cl.[5] C10L *1/32*
U.S. Cl. 44—282 **20 Claims**

1. A process for preparing coal for use as a fuel, comprising grinding coal particles in the presence of water to form a coal-water slurry having solid coal particles with a particle size not exceeding about 80 microns, classifying the ground coal-water slurry in a solid bowl centrifuge to provide a centrate containing solid particles with a particle size distribution of from about 5 microns to about 20 microns and to provide a

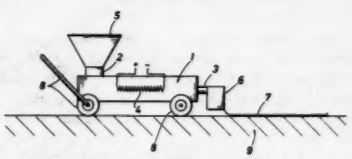


centrifuge cake of solids having a particle size distribution of from about 10 microns to about 80 microns, and regrinding the classifier cake, wherein more than about 50% of the slurry particles are larger than 6 microns.

H982
METHOD FOR PREPARING POLYMERIC MEMBRANES IN-SITU AND AN APPARATUS FOR PERFORMING THIS PROCESS

Mark A. Berggren, 6233 Haskell, Houston, Tex. 77007, and Lance M. Garton, 7610 Miller Glen La., Houston, Tex. 77072

Filed Dec. 20, 1989, Ser. No. 453,871
Int. Cl.[5] B29C *63/00*; B32B *31/00*; B05D *3/12*; B28B *1/00*
U.S. Cl. 264—171 **20 Claims**



1. A process to produce a polymeric waterproof sealing membrane and adhere it to the roof of a structure, the process comprising the steps of:

(a) providing a polymeric waterproof sealing material on the roof;

(b) melting the polymeric material on the roof;

(c) forcing the melted polymeric material through a light movable die, located on the roof, wherein the die shapes the meld into a film;

(d) positioning the movable die in close proximity to the roof and moving the movable die across the roof; and

(e) applying the film melt directly to the roof before the film melt has cooled significantly from the temperature of the melt at the movable die.

H983
POLYKETONE FIBERS

Houston S. Brown, 7306 Tunbury La., Houston, Tex. 77095, and Paul A. Westbrook, 15419 Rio Plz., Houston, Tex. 77083

Division of Ser. No. 175,024, Mar. 30, 1988, abandoned. This application Jun. 21, 1989, Ser. No. 369,402
Int. Cl.[5] B29C *47/88*, *47/30*
U.S. Cl. 264—211.17 **8 Claims**

1. A process for preparing a fiber from a linear alternating polymers of carbon monoxide and at least one ethylenically

unsaturated hydrocarbon wherein said process comprises the following steps:

(i) adding a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon to a high shear mixing device;

(ii) mixing the contents at temperatures between about 175° C. and 300° C.;

(iii) extruding the contents into a fiber; and

(iv) quenching the extruded strand.

H984

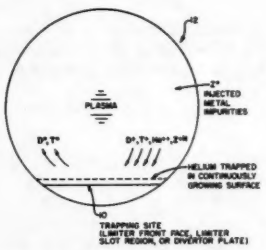
SELF-PUMPING IMPURITY CONTROL

Jeffrey N. Brooks, Darien, and Richard F. Mattaa, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 564,112, Dec. 21, 1983, abandoned. This application Mar. 17, 1989, Ser. No. 324,999

Int. Cl.[5] G21B *1/00*

U.S. Cl. 376—146 **4 Claims**


PLASMA
INJECTED METAL IMPURITIES
HELIUM TRAPPED IN CONTINUOUSLY GROWING SURFACE
TRAPPING SITE (LIMITER FRONT FACE, LIMITER SLOT REGION, OR DIVERTOR PLATE)

1. In a magnetic plasma confinement nuclear fusion system having a vessel, a hydrogen plasma within said vessel, said hydrogen plasma containing helium ash impurities, apparatus for removing said helium ash from said plasma, during plasma burn, said apparatus comprising:

(a) a fixed helium trapping site within said magnetic plasma confinement fusion system, said trapping site having a surface of trapping material exposed to the plasma, said trapping material being selected from the group consisting of vanadium, niobium, tantalum, tungsten and molybdenum; and

(b) means for injecting particles of said trapping material into said plasma whereby during operation a coating of said trapping material is continuously deposited on said trapping site, at a rate sufficient to prevent saturation of impurity trapping during plasma.

H985

CELL COMPARTMENT FOR BATTERY MATRIX

John A. Christopulos, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 25, 1990, Ser. No. 589,147

Int. Cl.[5] H01M *2/10, 14/00*

U.S. Cl. 429—99 **4 Claims**

1. A battery cell compartment comprising:

a housing;

a plurality of berths disposed within said housing, each berth having at least one opening;

a door panel;

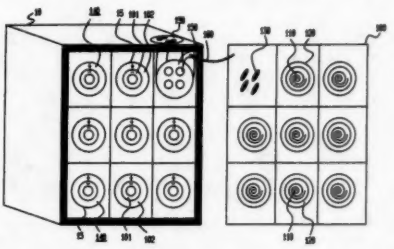
means to attach said door panel to said housing;

a plurality of electrically connected concentric springs attached to said door panel in a manner such that the concentric springs are aligned with the openings of said berths when said door panel is attached to said housing;

a plurality of circuit power pins attached to said door panel and electrically connected in series to said concentric springs;

a plurality of diodes electrically connected to said circuit power pins;

a current fuse electrically connected said diodes; and



means for connecting an application device circuit to said battery cell compartment.

H986

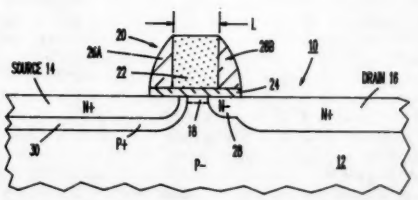
FIELD EFFECT-TRANSISTOR WITH ASYMMETRICAL STRUCTURE

Christopher F. Codella, Marlboro; Nivo Rovedo, Lagrangeville, and Seiki Ogura, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1989, Ser. No. 363,747

Int. Cl.[5] H01L *2/265*

U.S. Cl. 437—41 **12 Claims**



1. A method of forming a field effect transistor, comprising the steps of:

providing a semiconductor substrate of first conductivity type;

forming a generally conformal layer of gate electrode material over said substrate;

forming a mask over said layer of gate electrode material, said mask including a generally vertical edge situated over said substrate;

forming a halo region of said first conductivity type in said substrate self-aligned with said vertical edge of said mask;

forming a source region of said second conductivity type in said halo region;

using said mask to define a gate electrode from said layer of gate electrode material while exposing a previously masked portion of said substrate adjoining said gate electrode;

forming a lightly doped region of said second conductivity type in said substrate self-aligned with an edge of said gate electrode on a side of said gate electrode opposite said source region;

forming a sidewall of protective material on the side of said gate electrode overlying said lightly doped region; and

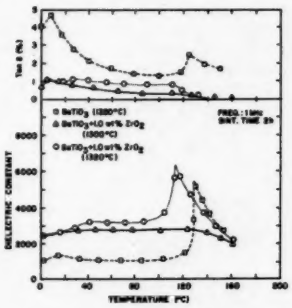
forming a drain region of said second conductivity type in said substrate using said gate electrode and said sidewall as a mask such that said lightly doped region extends said drain region under said sidewall;

said step of forming said source region performed before said steps of forming said lightly doped region and said sidewall so that said lightly doped region extends only said drain region under said sidewall.

H987
TEMPERATURE STABLE CERAMIC DIELECTRIC COMPOSITIONS

Relva C. Buchanan, 1723 Henry St., Champaign, Ill. 61821, and Aléna K. Maurice, 1205 Florida Ave., Apt. 14A, Urbana, Ill. 61801

Filed Jun. 12, 1989, Ser. No. 364,416
Int. Cl.[5] C04B *35/49*
U.S. Cl. 501—137 **4 Claims**



1. A ceramic dielectric composition having a dielectric constant in the range from 1800 to 3500 in the temperature range from −50 to +150 degrees C., and having a heat dissipation factor, tangent delta, not exceeding 3 percent in said temperature range, consisting essentially of 98 to 99.5 percent by weight of barium titanate and 0.5 to 2.0 percent by weight of zirconium dioxide.

H988
POLYMER BLENDS

William P. Gergen, Houston; Joseph M. Machado, Richmond; Dixie G. Waters, and Randall P. Gingrich, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1989, Ser. No. 429,915
Int. Cl.[5] C08L *77/00*
U.S. Cl. 525—179 **23 Claims**

1. A polymer blend comprising a major proportion of a polyamide polymer having each recurring unit of up to 16 carbon atoms and a melting point in excess of 200° C., and lesser proportions of (a) a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, and (b) an acidic polymer containing moieties of α-olefin and α,β-ethylenically unsaturated carboxylic acid, optionally with a third monomer, the monomer being a non-acidic, low molecular weight polymerizable monomer, and optionally with a portion of the carboxylic acid group neutralized with non-alkali metal.

H989
PURIFICATION OF HYDROLYZED PROTEIN BY EXTRACTION

Guy J. Hartman, Decatur, Ill., assignor to A. E. Staley Manufacturing Co., Decatur, Ill.

Filed Jul. 13, 1990, Ser. No. 552,403
Int. Cl.[5] C07K *3/12, 3/00*
U.S. Cl. 530—422 **6 Claims**

1. A method of purifying a hydrolysed protein comprising contacting a mixture of a hydrolysed protein and a chlorohydrin with a substantially phase-incompatible fluid extractant capable of extracting at least a portion of said chlorohydrin from said aqueous mixture and separating said hydrolysed protein from said substantially phase-incompatible fluid extractant.

H990
RECRYSTALLIZATION OF 3-NITRO-1,2,4-TRIAZOL-5-ONE FROM DIMETHYLSULFOXIDE AND METHYLENE CHLORIDE

Eleonore G. Kayser, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 26, 1989, Ser. No. 386,378
Int. Cl.[5] C07D *249/12, 249/14*
U.S. Cl. 548—263.8 **5 Claims**

1. A process for producing finely divided 3-nitro-1,2,4-triazol-5-one of uniform particle size comprising:

(1) dissolving conventional large, jagged, rodlike 3-nitro-1,2,4-triazol-5-one crystals having a particle size of (2,702 cm^2/cm^3 in hot dimenthylsulfoxide at a temperature of from about 60° C. to about 90° C.;

(2) injecting the hot dimethylsulfoxide solution through an opening of 0.70 mm or less in diameter in methylene chloride which is kept at a temperature of from about −10° C. to about 30° C.; and

(3) isolating the finely divided particles of 3-nitro-1,2,4-triazol-5-one which are produced in step (2).

H991
SYNTHESIS OF NITRATOMETHYLMETHYLOXETANE (NMMO)

John W. Fischer, and Richard A. Hollins, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 3, 1989, Ser. No. 296,556
Int. Cl.[5] C07D *305/04*
U.S. Cl. 549—510 **16 Claims**

1. A method of preparing 3-nitratomethyl-3-methyloxetane comprising the following steps:

dissolving hydroxymethylmethyloxetane in a solvent;

dissolving dinitrogen pentoxide in a solvent;

adding said dinitrogen pentoxide solutions to said hydroxymethylmethyloxetane solution;

holding said reaction mixture at a first reaction temperature;

stirring said reaction mixture for a time sufficient to complete the reaction while holding said reaction mixture at said first reaction temperature;

washing said reaction mixture with water;

washing said reaction mixture with saturated sodium bicarbonate solution;

washing said reaction mixture with saturated sodium chloride solution;

drying said reaction mixture with anhydrous sodium sulfate;

filtering said sodium sulfate from said reaction mixture;

removing said solvent at reduced pressure;

purifying said 3-nitratomethyl-3-methyloxetane by vacuum distillation; and

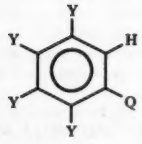
holding said product at a second reaction temperature while purifying.

H992
PREPARATION OF FLUOROBENZENES BY THE DECARBOXYLATION OF FLUOROPHTHALIC ACIDS OR BENZOIC ACIDS

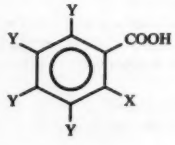
Lawrence B. Fertel, Buffalo, and Henry C. Lin, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Dallas, Tex.

Filed Aug. 30, 1990, Ser. No. 574,861
Int. Cl.[5] C07C *17/33, 17/22, 22/08*
U.S. Cl. 570—142 **14 Claims**

1. A process for the production of polyfluorobenzenes represented by the following formula:



wherein Q may be H or Cl, and each Y maybe be independently F or H provided that at least 2 Y's are F which comprises heating a polyfluorobenzoic acid or polyfluorophthalic acid starting material represented by the following formula:



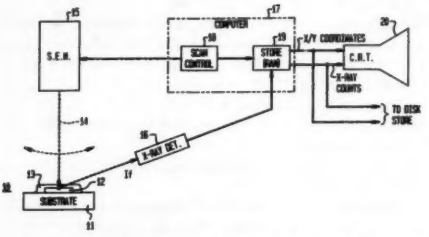
wherein X may be COOH or Cl, and each Y maybe be independently F or H provided that at least 2 Y's are F in a solvent selected from the group consisting of quinoline and n-methyl-2-pyrrolidone, in the presence of a catalyst selected from the group consisting of copper metal, Cu_2O and CuO.

H993

THIN FILM THICKNESS MAPPING TECHNIQUE

Richard G. Sartore, Bradley Beach, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 17, 1990, Ser. No. 583,612
Int. Cl.[5] G01N *23/02*
U.S. Cl. 250—307 **4 Claims**



1. A method of detecting defects and mapping the thicknesses of passivation layers of an integrated circuit comprising the steps of:

directing a narrow, high energy, electron beam to impinge upon an integrated circuit, by increasing the accelerating voltage of the electron beam until the electrons have a minimal amount of energy to penetrate through the thickness of a passivation layer of the integrated circuit;

increasing said voltage a predetermined amount above the voltage required for passivation layer penetration wherein the transmitted electrons serve to interact with a sublayer of film material and to generate distinct X-rays and wherein the predetermined amount of voltage increase is sufficient to achieve a substantially linear relationship between the X-ray intensity from the film material and the thickness of the passivation layer;

raster scanning the increased-intensity electron beam over the area of interest of the integrated circuit;

detecting any X-rays that are generated during the raster scanning of the electron beam;

visually displaying a count of X-rays detected during the raster scanning; and

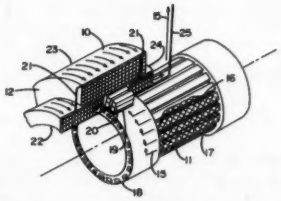
compensating for the absorption effect of the X-rays through the passivation layer and sublayer by a predetermined formula.

H994

TRANSPOSED AIR CORE HOMOPOLAR GENERATOR CONDUCTORS

David W. Ohst, Livermore, Calif.; Jack T. Gunn, Vancouver, and Dennis Pavlik, Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1990, Ser. No. 642,978
Int. Cl.[5] H02K *31/00*
U.S. Cl. 310—178 **7 Claims**



1. A rotor/stator apparatus for a series wound air core homopolar generator with high magnetic fields which controls and reduces eddy currents comprising:

means for segmented stator current collection to prevent eddy currents from flowing;

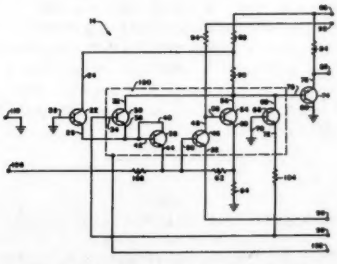
means for segmented rotor conductors to prevent eddy currents from flowing.

H995

PREAMPLIFIER FOR LASER GUIDED PROJECTILE

Robert D. Moran, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 15, 1984, Ser. No. 671,711
Int. Cl.[5] H03G *3/10, 3/18, 3/30*
U.S. Cl. 330—278 **4 Claims**



1. An amplifier having controllable gain comprising:

a plurality of means for amplifying an externally providable signal, and

power supply means for establishing gain operation conditions of each of the plurality of amplifying means,

the amplifier being determined by the gain of the of the plurality of amplifying means, the gain of the respective amplifying means being controllable between a gain ON condition and a gain OFF condition by selection of supply power values providable to the respective amplifying means for controlling the gain of the amplifier.

H996

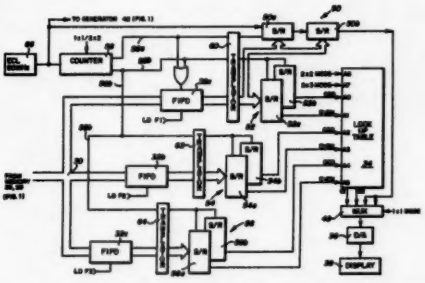
HIGH RESOLUTION PAGE IMAGE DISPLAY SYSTEM

Lynn D. McWaters, Garland, and Kenneth T. Lovelady, Irving, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Continuation of Ser. No. 4,953, Jan. 20, 1987, abandoned. This application Aug. 16, 1988, Ser. No. 233,993

Int. Cl.[5] G09G *1/06*

U.S. Cl. 340—728 5 Claims



1. An image processing system for converting high resolution rasterized black/white picture element scan data of an image to a lower resolution multi-level gray value for display on a cathode ray tube comprising:

means for extracting a selected group of black/white picture elements from the rasterized scan data; and

means for converting said selected group of black/white picture elements to a variable brightness single gray level picture element for display on the cathode ray tube, the displayed gray level of said picture element being preselected based upon the number of occurrences of a black or a white picture element in said selected group to thereby reduce the number of picture elements displayed on the cathode ray tube while displaying the image at its actual size in gray level.

H997

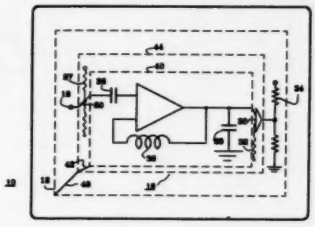
VIDEO DISPLAY ENHANCEMENT

Barry S. Bronson, 13750 Via Alto Ct., Saratoga, Calif. 94070

Filed Mar. 26, 1990, Ser. No. 499,103

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—521 1 Claim



1. A method of enhancing a video display comprising the steps of:

selecting a target area to be enhanced within the video display;

selecting a maximum area, surrounding the target area, within the video display;

selecting an exploded view area, within the maximum area and including the target area; and

creating a second display in which the target area is enlarged to fill the exploded view area, the display between the target and maximum areas is compressed to fit between the exploded and maximum areas, and the area within the video display outside the maximum area is displayed without change.

REISSUES

NOVEMBER 5, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,732
METHOD OF MACHINING A WORKPIECE IN A TURRET LATHE AND AN NC LATHE FOR PERFORMING THIS METHOD

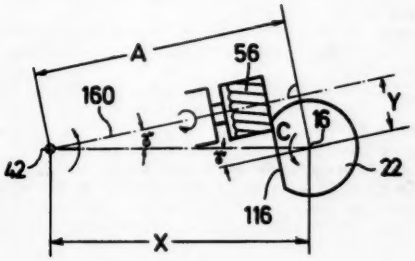
Helmut F. Link, Aichwald, Fed. Rep. of Germany, assignor to Index-Werke GmbH & Co. KG Hahn & Tessky, Fed. Rep. of Germany

Original No. 4,635,340, dated Jan. 13, 1987, Ser. No. 636,886, Aug. 2, 1984. Application for reissue Jan. 10, 1989, Ser. No. 295,484

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328327

Int. Cl.[5] B23B *5/36, 35/00*

U.S. Cl. 29—558 **14 Claims**



3. A method of machining a circumferential portion of a rotatable workpiece off-center comprising the following steps which are carried out simultaneously while performing such machining:

(a) rotatively displacing the workpiece about a first axis in a defined direction of rotation;

(b) rotating a cutting tool about a second axis for machining a circumferential portion of said workpiece off-center from said first axis;

(c) rotatively displacing said second axis about a third axis in said defined direction of rotation;

said third axis of rotation being parallel to said first axis and spaced from said first axis by a variable distance;

said cutting tool being located on said second axis a predetermined tool distance from said third axis;

said second axis being positioned perpendicular to a predetermined plane of such workpiece which is parallel to said first axis; and

(d) providing relative transverse displacements between said third axis and said first axis;

the rotational displacements of said workpiece about said first axis and said tool about said third axis being simultaneously controlled to provide the same angular displacement of each in the same direction to maintain said second axis perpendicular to said predetermined plane of said workpiece while performing such machining; and

the transverse displacement of said third axis relative to said first axis being simultaneously controlled relative to said rotational displacements of said workpiece about said first axis and said tool about said third axis to effect the positioning of said cutting tool in a direction perpendicular to said plane in a predetermined manner while performing such machining.

Re. 33,733
DEVICE FOR DRIVING A DRILLING AND/OR IMPACTING TOOL

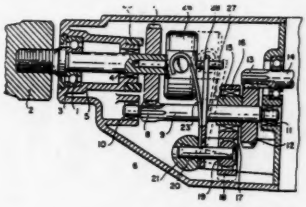
Wilhelmus J. M. Hendrikx, 297 Liesboslaan, 4838 Ev Breda; Antonie J. Moolenaar, 27 Cypressenstraat, 4949 An Dorst, and Jan P. Houben, 56 Rechterenstraat, 4834 Lv Breda, all of Netherlands

Original No. 4,726,430, dated Feb. 23, 1988, Ser. No. 673,617, Nov. 21, 1984. Application for reissue Dec. 22, 1988, Ser. No. 289,365

Claims priority, application Netherlands, Nov. 24, 1983, 8304043

Int. Cl.[5] B23B *45/16*

U.S. Cl. 173—109 **18 Claims**



1. A device for driving a drilling and/or impacting tool comprising:

a tool shaft journalled in a housing so as to be rotatable, if necessary, one end of said shaft being connectable with the tool whereas the other end is accessible for engagement with an oscillatory impact body movable in the housing by means of a guide and a rotatable driving shaft operatively connected through a transmission for impacting rotation to the tool shaft and/or movement to the impact body against the tool shaft, characterized in that the transmission comprises means for converting the rotary movement of the driving shaft into an oscillatory movement of a driving element, which is connected through an elastic member with the impact body, said elastic member has a non-linear spring characteristic.

8. A device as claimed in claim 1, and further including pivotol arms, said guide for the impact body [is] *being* formed by one or more of said pivotol arms.

9. A device as claimed in claim [1,] *8* characterized in that said elastic member is arranged between said [motion converting means] *means for converting the rotary movement* and said pivotol arm of the impact [*mass*] *body.*

Re. 33,734

Patent Not Issued For This Number

Re. 33,735
GOLF CLUB SHAFT

Joseph W. Rumble, Hartford, and William G. Sprague, Litchfield, both of Conn., assignors to Brunswick Corporation, Skokie, Ill.

Original No. 4,431,187, dated Feb. 14, 1984, Ser. No. 391,988, Jun. 25, 1982. Application for reissue Jun. 13, 1989, Ser. No. 365,951

Int. Cl.[5] A63B *53/12*

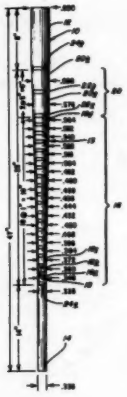
U.S. Cl. 273—80 R **17 Claims**

1. A golf club shaft having a grip end, a hosel end and a main shaft portion intermediate the grip and hosel ends, the main shaft portion having a plurality of [stop] *step* portions with

each adjacent pair of step portions having a transitional portion therebetween, the main shaft portion comprising:

a first step portion extending partly along a length of the main shaft portion and having a first diameter;

a second step portion extending partly along the length of the main shaft portion and spaced from the first step portion and having a second diameter different than the first diameter; and



a transitional portion disposed between the first and second step portions having a tapered outer surface of changing diameter smoothly linking the first and second step portions, *the tapered outer surface being characterized by a taper angle of approximately 1.5°*, the length of the transitional portion being substantially greater than the difference between the first and second diameters wherein the pattern of the step portions and transitional portions of the main shaft portion is substantially as shown in FIG. 1.

Re. 33,736

PERIODIC PERMANENT MAGNET STRUCTURE WITH INCREASED USEFUL FIELD

John P. Clarke, Cranford, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Original No. 4,731,598, dated Mar. 15, 1988, Ser. No. 89,100, Aug. 24, 1987. Application for reissue Aug. 30, 1990, Ser. No. 578,177

Int. Cl.[5] H01F *7/00*

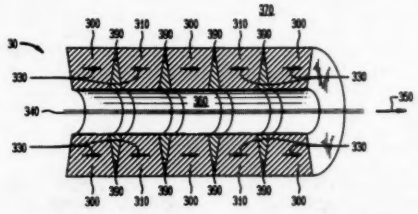
U.S. Cl. 335—210 **7 Claims**

[1. A device for manipulating a charged particle beam traveling along a beam path, said device comprising:

a pair of similar permanent magnets, one of said magnets having its magnetization aligned parallel to said beam path and in a direction opposite to the magnetization of the other said magnet;

an interstitial pole piece interposed between said magnets;

said magnets and interstitial pole piece aligned adjacent to and parallel to said beam bath; and,



one said interstitial pole piece cross section, in a plane which contains said beam path, being tapered away from said beam path.]

Re. 33,737

OPTICAL FIBER COATED WITH AN ORGANOPOLYSILOXANE CURABLE ACTINIC RAYS

Yoshinori Hida, Kawasaki; Shohei Kozakai; Seiji Katayama, both of Annaka, all of Japan, and Noriyuki Meguriya, Akron, Ohio, assignors to Shin-Etsu Chemical Co., Ltd., Chiyoda, Japan

Original No. 4,733,942, dated Mar. 29, 1988, Ser. No. 930,002, Nov. 12, 1986. Application for reissue Mar. 13, 1990, Ser. No. 492,779

Claims priority, application Japan, Nov. 12, 1985, 60-259275

Int. Cl.[5] G02B *6/00*

U.S. Cl. 385—141 **3 Claims**

1. A coated optical fiber which comprises:

(a) a fused quartz glass-made optical fiber base; and

(b) a coating layer on the optical fiber base formed of a coating material comprising, as the principal ingredient thereof, an organopolysiloxane represented by the average unit formula

$$(R^1)_a[(R^3O)_n(R^4)_{3-n-m}(R^5O)_mSi-R^2-]_bSiO_{(4-a-b)/2}$$

in which the groups denoted by R^1 and R^4 are each, independently from the others, a substituted or unsubstituted monovalent hydrocarbon groups, R^2 is a divalent hydrocarbon group having 2 to 4 carbon atoms or an oxygen atom, R^3 is a monovalent organic group having 4 to 25 carbon atoms and 1 to 3 ethylenically unsaturated groups, R^5 is a monovalent hydrocarbon group free from aliphatic unsaturation having 1 to 18 carbon atoms or an organosilyl group represented by the general formula

$$-SiR^6_2-O)_pSiR^6,$$

R^6 being a monovalent hydrocarbon group having 1 to 9 carbon atoms and p being zero or a positive integer, a is a positive number in the range from 1.6 to 2.2, b is a positive number in the range from [0.02] *0.002* to 0.5 with the proviso that a+b is in the range from 1.8 to 2.2, n is 1, 2 or 3, m is zero, 1 or 2 with the proviso that n+m is 1, 2 or 3 and R^3 has at least two ethylenically unsaturated groups when n is 1.

PLANT PATENTS

GRANTED NOVEMBER 5, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,700

ORANGE TREE 'BECK EARLY NAVEL'

James W. Beck, 2118 9th Ave., Delano, Calif. 93215

Continuation of Ser. No. 356,680, May 24, 1989, abandoned, which is a continuation of Ser. No. 623,223, Jun. 21, 1984, abandoned. This application Jul. 5, 1990, Ser. No. 549,545

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—45 1 Claim

1. A new and distinct variety of orange tree substantially as shown and described, characterized particularly as to novelty by a somewhat smaller tree size that the conventional Washington navel tree, a bright red-orange color of the fruit with a more durable rind than a conventional Washington navel orange and maturing during a relatively shorter period.

7,701

VARIETY OF STRAWBERRY NAMED FLORIKA

Annelise Bauer, Hechlstrasse 11, D-8211 Breitbrunn, and Birgit Schlindwein, Freising, both of Fed. Rep. of Germany, assignors to Annelise Bauer, Fed. Rep. of Germany

Filed Feb. 12, 1990, Ser. No. 478,641

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—48 1 Claim

1. The new distinct variety of *vescana* strawberry plant named Florika as herein described and illustrated.

7,702

PENTAS LANCEOLATA PLANT NAMED JESSICA

Russell R. Pennington, Sr., 10500 Isabelle Rd., Lafayette, Colo. 80026

Filed May 1, 1990, Ser. No. 517,080

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of *Pentas lanceolata* plant named Jessica, as illustrated and described.

7,703

ALSTROEMERIA PLANT NAMED MARIA

Erwin Mojonnier, 237 Quail Dr., Encinitas, Calif. 92024

Filed Jul. 24, 1990, Ser. No. 556,401

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Alstroemeria plant named Maria, as illustrated and described.

7,704

AFRICAN VIOLET PLANT NAMED LITTLE BLACKFOOT GIRL

Reinhold Holtkamp, Sr., Blumenstrasse 28, D 4242 Rees-Haffen, Fed. Rep. of Germany

Filed Aug. 10, 1990, Ser. No. 565,315

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Little Blackfoot Girl, as described and illustrated, and particularly characterized by its mid-size growth habit (13–15 cm in diameter); purplish red, single violet-shaped flowers; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse flowering; an abundance of blooms at one time, and continuous flowering; dark green, spear-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,705

AFRICAN VIOLET PLANT NAMED LITTLE NAVAJO GIRL

Reinhold Holtkamp, Sr., Blumenstrasse 28, D 4242 Rees-Haffen, Fed. Rep. of Germany

Filed Aug. 10, 1990, Ser. No. 565,318

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Little Navajo Girl, as described and illustrated, and particularly characterized by its mid-size growth habit (13–15 cm in diameter); blue, single violet-shaped flowers; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse flowering; medium green, girl-type leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

PATENTS

GRANTED NOV. 5, 1991

ERRATA

For CLASS	See PATENT NO.
119-051	5,062,382
119-173	5,062,383
118-723	5,062,508
229-117	5,062,527
241-079	5,062,601
248-027	5,062,604
248-061	5,062,605
248-171	5,062,606
248-211	5,062,607
248-289	5,062,608
248-676	5,062,609
249-052	5,062,610
251-129	5,062,611
256-011	5,062,612
266-044	5,062,613
266-216	5,062,614
266-217	5,062,615
267-064	5,062,616
267-132	5,062,617
267-140	5,062,618
267-154	5,062,619
267-260	5,062,620
269-305	5,062,621
297-129	5,062,650
359-206	5,062,679
385-131	5,062,680
385-050	5,062,681
385-085	5,062,682
385-087	5,062,683
385-027	5,062,684
385-114	5,062,685
385-033	5,062,686
385-128	5,062,687
359-619	5,062,688
359-230	5,062,689
359-059	5,062,690
359-056	5,062,691
359-045	5,062,692
359-241	5,062,693
359-498	5,062,694
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359-554	5,062,696
359-379	5,062,697

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359-430	5,062,699
359-508	5,062,700
439-096	5,063,130
422-082	5,063,178
250-343	5,063,275
346-143	5,063,451
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358-404	5,063,459
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395-800	5,063,494
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395-700	5,063,496
395-800	5,063,497
395-425	5,063,498
395-500	5,063,499
395-200	5,063,500
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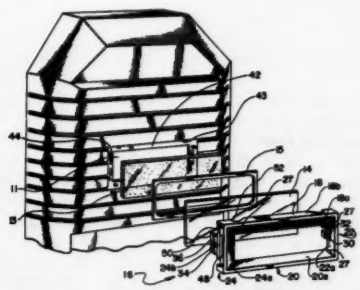
395-725	5,063,503
395-725	5,063,504
395-027	5,063,521
395-051	5,063,522
395-157	5,063,525
395-155	5,063,526
395-025	5,063,531
395-425	5,063,533
395-575	5,063,535
395-775	5,063,536
359-127	5,063,559
359-152	5,063,612

PATENTS

GRANTED NOVEMBER 5, 1991

GENERAL AND MECHANICAL

5,062,156
FACE SHIELD FILTER PLATE RETENTION
Burton L. Siegal, Skokie, Ill., assignor to Sellstrom Manufacturing Company, Palatine, Ill.
Continuation of Ser. No. 451,423, Dec. 15, 1989, abandoned. This application Dec. 6, 1990, Ser. No. 624,493
Int. Cl.[5] A61F *9/06*
U.S. Cl. 2—8 **13 Claims**



1. In a face-protecting device having a viewing port therein, the improvement which comprises supporting a filter plate on a support ledge of a face-protecting device and retaining the filter plate on the exterior of said face-protecting device by a flexible filter plate retainer provided with integral fastening means projecting inwardly therefrom and means for adjustably engaging the fastening means with the face-protecting device.

5,062,157
HEADBAND TOWEL
Theodore J. Muta, 1817 Fisher St., Munster, Ind. 46321
Continuation-in-part of Ser. No. 567,841, Aug. 15, 1990, which is a continuation-in-part of Ser. No. 519,767, May 7, 1990, abandoned. This application Mar. 12, 1991, Ser. No. 667,834
Int. Cl.[5] A41D *20/00, 23/00*
U.S. Cl. 2—171 **20 Claims**

1. A fabric head towel, conveniently carried about the head while also serving as a head covering for protecting one's head from heat, dirt, sun, and other environmental elements comprising:

a) a planar fabric material section, having inner and outer surfaces, opposed sides, and first and second opposed ends;

b) two elongated fabric material strips, extending from either side at the first opposed end, said strips having sufficient length to at least extend horizontally around one's head, and having interacting first fastener means sections incorporated in respective end sections of the elongated fabric material strips, for closably effecting a firm positioning of the fabric material section around one's head when the first opposed end is positioned upon one's forehead;

c) at least one second fastener means section, incorporated in an outer surface of the elongated fabric material strips and positioned to be accessible outwardly from the back of one's head; and

d) third fastener means sections, interactive with said second fastener means sections, positioned upon the inner surface of the planar fabric material section to interact closably with respective second fastener means sections whenever the second opposed end is urged backwardly over the surface of one's head, whereby the head covering is firmly secured to provide protection.

5,062,158
PROTECTIVE SHEETS HAVING SELF-ADHESIVE PROPERTY USED FOR WEARING ON CLOTHES AND KEEPING THEM CLEAN
Mitsuko Oka, and Yoshiharu Okumura, both of Shiga, Japan, assignors to Toray Industries, Inc., Tokyo, Japan
PCT No. PCT/JP89/00002, § 371 Date Sep. 1, 1989, § 102(e) Date Sep. 1, 1989, PCT Pub. No. WO89/06093, PCT Pub. Date Jul. 13, 1989
PCT Filed Jan. 5, 1989, Ser. No. 415,202
Claims priority, application Japan, Jan. 6, 1988, 63-1113
Int. Cl.[5] A41B *13/10;* **A41D** *13/04*
U.S. Cl. 2—46 **14 Claims**

1. Protective sheets having self-adhesive properties used for wearing on clothes and keeping the clothes clean, comprising: at least one electret sheet which is composed of a dielectric material injected with a static electrical charge, which has a surface electric charge density which is at least 1×10^{31} coulomb/cm^2, and whose weight per square meter is in a range of at least 10 g/m^2 and 100 g/m^2, said at least one electret sheet maintaining said static electrical charge while being worn without substantial dissipation of said static electrical charge, and said surface electric charge density being sufficient to retain said at least one electret sheet against clothing while the clothing is being worn.

5,062,159
PATIENT'S HOSPITAL GOWN
Beatrice Jakub, 2570 N. Pontiac Trail, Walled Lake, Mich. 48088
Filed Aug. 27, 1990, Ser. No. 572,869
Int. Cl.[5] A41D *13/00, 13/12*
U.S. Cl. 2—114 **8 Claims**

1. A patient's hospital gown having a front and rear, said gown comprising:

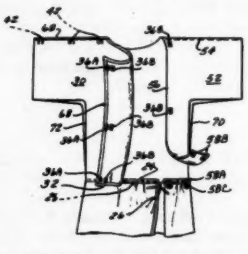
a lower portion comprising a fabric lower panel able to be wrapped around a patient's waist and forming an overlapped releasable seam at said front of the gown, said lower panel having a top and bottom edge;

a series of releasable fasteners for securing said seam;

a main front panel having a top and bottom edge and inside

and outside edges, said main front panel sewn to said top edge of the lower panel to form a seam extending along said bottom edge of said main front panel for a segment of the bottom edge at the outside thereof to form a flap portion comprised of a portion of said main front panel adapted to be drawn across the wearer's chest;

a rear panel having a top and bottom edge, sewn along said bottom edge thereof to said lower panel, said rear panel having left and right sleeve sections, one of said sleeve sections



having attached thereto an auxiliary front panel adapted to be drawn down over the wearer's chest and meeting said inside edge of said main front panel to form a releasable flap seam;

a series of releasable fasteners for securing said flap seam;

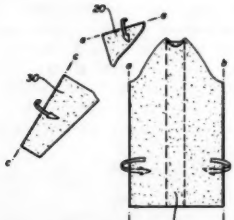
said main front panel formed with a sleeve section overlying said other sleeve section of said rear panel opposite from said right and left sleeve sections; a releasable seam formed along the top edge of said overlying sleeve sections of said main front panel and rear panel sleeve; and, a series of releasable fasteners for securing said releasable seam.

5,062,160

RAGLAN SLEEVE SURGICAL GOWN

John Dillon, Jr., El Paso, Tex., assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Jun. 4, 1990, Ser. No. 532,920
Int. Cl.[5] A41D *13/12*
U.S. Cl. 2—114 **11 Claims**



1. A garment comprising:

a single body portion formed of a sheet of material and having a neck opening and two arm openings formed by removing sections of the material;

two shoulder portions, each formed of material having been removed from the arm openings in the body portion; and

two lower sleeve portions, each affixed to one of the shoulder portions,

whereby the shoulder portions terminate between the shoulder and the elbow of the wearer and the lower sleeve portions extend downward toward the wrist of the wearer.

5,062,161

METHOD OF MAKING GARMENT, GARMENT AND STRAND MATERIAL

Roger I. Sutton, Bermuda Run, N.C., assignor to Golden Needles Knitting and Glove Co., Inc., Wilkesboro, N.C.

Continuation of Ser. No. 285,403, Dec. 16, 1988, abandoned.
This application Mar. 8, 1991, Ser. No. 668,813
Int. Cl.[5] A41D *19/02*; D04B *7/34*
U.S. Cl. 2—169 **13 Claims**

1. A method of making a protective garment comprising the steps of:

providing a strand material formed by a multifilament bundle of continuous metallic strands entwined with a transitory strand soluble in agents which have substantially no effect on the metallic strands,

manipulating the strand material, in a conventional manner which is incapable of manipulating metallic material alone to form a textile fabric and fabricating the textile fabric into a garment, and

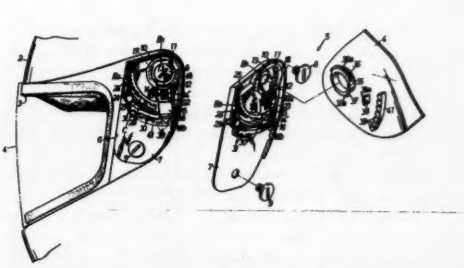
treating the textile fabric with an agent for removing the transitory strand so as to leave only the multifilament bundle of continuous metallic strands forming the fabric.

5,062,162

SHIELD PLATE-MOUNTING STRUCTURE IN HELMET

Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kako Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1991, Ser. No. 667,918
Claims priority, application Japan, Oct. 24, 1990, 2-286562
Int. Cl.[5] A42B *1/08*
U.S. Cl. 2—424 **4 Claims**



1. A shield plate mounting structure in a helmet for mount-

ing a shield plate to a mounting base plate secured to an outer side surface of a cap body such that the shield plate is turnable between a fully opened position in which a window of the cap body is fully opened and a fully closed position in which the window is fully closed, the structure comprising:

a cylindrical support provided on one of the mounting base plate and the shield plate;

a pivot provided on the other of said mounting base plate and said shield plate, said cylindrical support and said pivot being capable of being relatively turnably fitted with each other; and

a first bayonet mechanism between said mounting base plate and said shield plate for separably connecting said mounting base plate and said shield plate through a relative pivotal movement therebetween;

a second bayonet mechanism provided between said mounting base plate and said shield plate at a position radially outwardly of said first bayonet mechanism for separably connecting said mounting base plate and said shield plate through a relative pivotal movement therebetween;

wherein separating positions of said first and second bayonet mechanisms are set at first and second different rotational positions of said shield plate; and

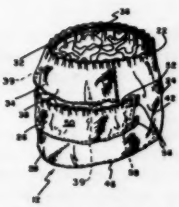
wherein said shield plate is provided with a resilience permitting a predetermined deformation thereof for disconnection of the second bayonet mechanism in the second rotational position.

5,062,163

HEAD PROTECTOR FOR USE WITH HARD HEAD GEAR

I. D. Jean Avey, Rt. 1, Box 90, Albert, Kans. 67511

Filed Mar. 13, 1987, Ser. No. 25,638
Int. Cl.[5] A42B *3/00*
U.S. Cl. 2—424 4 Claims



1. A head protection assembly adapted to be connected about a tapered brim section of a hard hat structure to be worn on the head of a person, comprising:

a) a brim support section mountable in a resilent manner about the tapered brim section of a hard hat structure

b) a mid-body cover section integral with a lower portion of said brim support section to cover head and ear portions of the person utilizing same;

c) a chin protector and anchor assembly integral with a lower portion of said mid-body cover section;

d) said chin protector and anchor assembly including a left flap cover member and a right flap cover member downwardly depending from said mid-body cover section; each of said left flap cover member and said right flap cover member of substantial width operable to engage and cover chin and mouth portions of the person wearing same;

e) said chin protector and anchor assembly having a connector assembly to adjustably connect a lower portion of said left flap cover member to said right flap cover member to fit in a weather sealing and enclosed condition about the chin portion of the person wearing same; and

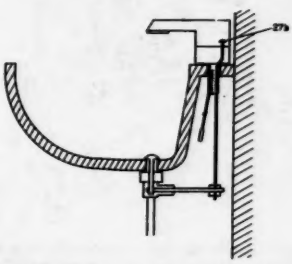
f) said brim support section including a brim portion constructed of an elastic material having a pair of tuck portions therein to provide the necessary clamping action about the tapered brim section of the hard hat structure operable to elastically clamp against a forehead portion of the person wearing same.

5,062,164

AUTOMATIC MIXING FAUCET

Chang H. Lee, 300 Winston Dr., Apt. 810, cliffside Park, N.J. 07010, and Young J. Kim, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 359,994, Jun. 1, 1989, Pat. No. 4,953,236, which is a continuation of Ser. No. 244,135, Sep. 14, 1988, Pat. No. 4,886,207. This application Jun. 30, 1989, Ser. No. 374,666
Int. Cl.[5] E03C *1/04*; C11D *9/18*
U.S. Cl. 4—194 8 Claims



1. A water supply valve including a valve body having a water chamber formed therein; a valve piston in said chamber and dividing said water chamber into first and second chambers, said valve body having a water inlet and water outlet opening formed therein and communicating with said first chamber, said valve piston, in a first position, closing communication through said first chamber between said water inlet and outlet opening and, in a second position, opening communication therebetween; pilot valve means connected between said second chamber and said outlet opening for selectively permitting and closing off communication between said second chamber and said water outlet opening, thereby to reduce pressure in said second chamber when such communication is permitted; sensor means for detecting the presence of a physical object, and means responsive to said sensing means for actuating said pilot valve to permit communication between said second chamber and said water outlet, thereby to permit water pressure in said first chamber to move said valve piston to its second position and open the valve to allow water to flow from said inlet opening to said outlet opening, said sensor means comprising an IR sensor; and said responsive means including an electric motor and transmission means connected between said motor and said pilot valve; said transmission means including cam means rotated by said motor for operating said pilot valve.

5,062,165

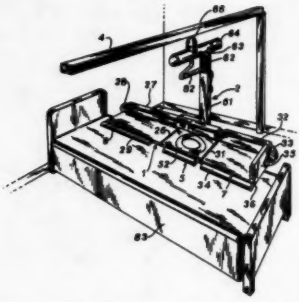
BEDSIDE TOILET INCORPORATING OVERHEAD HOIST

Harry D. Kerr, 4641 N. Ardmore Ave., Whitefish Bay, Wis. 53217

Filed Aug. 3, 1990, Ser. No. 562,895
Int. Cl.[5] A61G *9/00*
U.S. Cl. 4—480 16 Claims

1. A construction for transporting a disabled patient, comprising an elongated platform to support a patient and including a back section, a posterior section and a leg section, said sections being hingedly connected for movement between a generally horizontal position and an operative position where said posterior section is disposed generally horizontally and said back section extends upwardly from said posterior section and said leg section extends downwardly from said posterior section, a supporting structure, cantilevered support means for supporting said posterior section in cantilevered relation from said supporting structure, an overhead track, trolley means movable on the track and connected to said supporting structure, first operating means for pivoting said back section relative to said posterior section, second operating means for

pivoting said leg section relative to said posterior section, said supporting structure including a first support member connected to said posterior section and a second support member connected to said trolley means, said first and second support members being movable relative to each other to vary the vertical distance between said track and said platform, drive



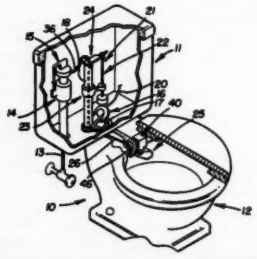
means for moving said support members relative to each other, a horizontal beam interconnecting the upper end of said second support member and said trolley means, and handle means connected to said beam and disposed in spaced relation above said platform in position to be grasped by a patient supported on the platform.

5,062,166

OVERFLOW CONTROL APPARATUS FOR WATER CLOSETS

Tom Krenecki, 1761 Las Raposas, Santa Rosa, Calif. 95405

Filed Sep. 17, 1990, Ser. No. 583,494
Int. Cl.[5] E03D *11/02*
U.S. Cl. 4—427 **14 Claims**



11. Overflow control apparatus in combination with a water closet having a tank, a vertically disposed overflow tube mounted in said tank, a bowl refill tube having its distal end communicating with an open upper end of said overflow tube, a bowl, flush valve means movable between a normally closed position stopping communication of water from said tank to said bowl and an open position communicating water from said tank to said bowl, and means for selectively moving said flush valve means to its open position, said overflow control apparatus comprising shut-off means for applying a closing force to said flush valve means to move it from its open position and to hold it at its closed position, said shut-off means comprising

reciprocal plunger means reciprocally mounted on said overflow tube, vertically above said flush valve means, for being released and dropped vertically under the influence of gravity from a raised position to a lowered position for applying said closing force to said flush valve means to move it from its open position and to hold it at its closed position,

trip means movably mounted on said overflow tube for movement from a first position for holding said plunger means in its raised position to a second position releasing said plunger means to permit it to drop to its lowered position,

control means for moving said trip means from its first position to its second position, and

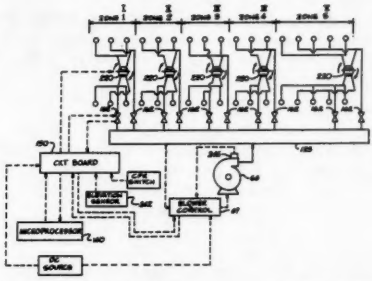
a cap fixedly securedly mounted on the upper end of said overflow tube and wherein said trip means is slidably mounted on said cap.

5,062,167

BIMODAL TURNING METHOD

James M. C. Thomas, Mt. Pleasant; James R. Stolpmann, Charleston; William T. Sutton, Charleston, and James J. Romano, Charleston, all of S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

Division of Ser. No. 355,755, May 22, 1989, Pat. No. 4,949,414, which is a continuation-in-part of Ser. No. 321,255, Mar. 9, 1989, abandoned. This application Jul. 18, 1990, Ser. No. 555,169
Int. Cl.[5] A61G *7/057*
U.S. Cl. 5—61 **3 Claims**



1. A method for relieving the pressure points between a patient and the sacks of a low air loss patient support system initially maintained at a first pressure profile, the method comprising:

(a) supporting the patient on a plurality of elongated inflatable sacks wherein each sack extends transversely across the longitudinal centerline of the patient support and each sack includes a pair of separately pressurizable chambers, one of said chambers being disposed at least partly above the other of said chambers, one of said chambers being disposed predominately to the left side of the centerline and having a minority portion to the right side of the centerline, and one of said chambers being predominately disposed to the right side of the centerline and having a minority portion to the left of the centerline;

(b) elevating the head and chest of the patient to an angle between 0° and 30° above the horizontal;

(c) supplying air pressure to the sacks in a manner so that both sides of a first group of sacks can be maintained at a separate pressure profile from both sides of a second group of sacks;

(d) decreasing the air pressure to both sides of the sacks in said first group during a first interval of time to a second pressure profile;

(e) increasing the pressure being supplied to both sides of the sacks of said second group during said first interval of time until a third pressure profile is being provided to said second group;

(f) maintaining said first group of sacks at said second pressure profile and said second group of sacks at said third pressure profile during a second interval of time;

(g) decreasing the pressure being supplied to the sacks in said second group during a third interval of time until said second pressure profile is being provided to said second group;

(h) increasing the pressure being supplied to the sacks in said

first group during said third interval of time until said third pressure profile is being provided to said first group; and

(i) maintaining said first group of sacks at said third pressure profile and said second group of sacks at said second pressure profile during a fourth interval of time.

5,062,168

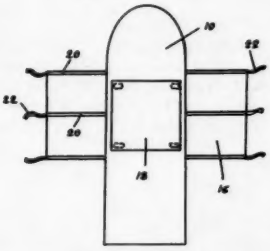
COVER-UP FOR INFANTS

Vera M. Kocib, 1315 Piper Dr., Lake Havasu City, Ariz. 86403

Filed Dec. 21, 1990, Ser. No. 631,999

Int. Cl.[5] A47G *9/00*

U.S. Cl. 5—413 **7 Claims**



1. An infant supporting article comprising:

a) An oblong piece of wrapping material, the dimension of said piece of material being from approximately 100 cm×30 cm to about 150 cm×45 cm, fastening means, attached to both longer sides of said piece of wrapping material, approximately within the middle third of the total length of said piece of material,

said fastening means comprising two supplemental rectangles, approximately 30 cm×35 cm large, of said wrapping material, each said rectangle having one longer edge sewn to one longer edge of said oblong piece of wrapping material, and remaining free longer edges of said rectangles are provided with means for attaching said rectangles together along said edges, the joint width of said rectangles being about one third bigger than the width of said piece of wrapping material, each one of said rectangles being gathered in the middle and along both shorter edges of said rectangles by lengths of expandable ties, said ties being means for attaching one of said rectangles to the other, and a waterproof pad attached to said piece of wrapping material by means allowing easy removal of said pad,

whereby the infant is laid with his/her head towards one narrower end of said piece of material, the free unused portion of said piece of said material being loosely folded over the body of the lying infant and secured in place with said fastening means, thus keeping the infant's body securely covered-up and warm, while allowing for unrestricted movements of the infant's limbs and body.

5,062,169

CLINICAL BED

Earl W. Kennedy, Joplin; Robert D. Oexman, and Larry Higgins, both of Carthage, all of Mo., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 9, 1990, Ser. No. 491,327

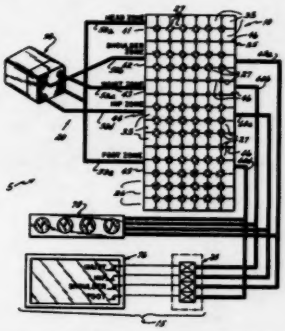
Int. Cl.[5] A47C *27/08*

U.S. Cl. 5—449 **11 Claims**

1. Clinical bed apparatus for use in diagnosing sleep disorders by non-invasively monitoring a person reclining on a bed, which apparatus includes

a bed for supporting a person reclining atop the bed, said bed having at least one isolated fluid-filled zone maintained at a pressure substantially above atmospheric pressure,

readout and recording means including a readout and recording device, and connecting means extending between said readout and recording device and said fluid-filled zone, said readout and recording means being operative to measure and record movement of a person reclining on



said bed as a result of fluid pressure changes in said fluid-filled zone measured and recorded on a record by said readout and recording device, said record being of a form and sufficiently sensitive to enable sleep disorders to be diagnosed from said record.

5,062,170

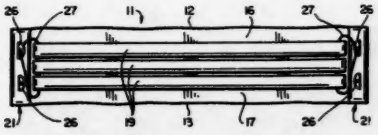
WATERBED MATTRESS AND CORNER STRUCTURE WITH TETHERED INSERT

John B. Johenning, Beverly Hills, Calif., assignor to Strata Flotation, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 490,130, Mar. 6, 1990, abandoned. This application Aug. 17, 1990, Ser. No. 569,096

Int. Cl.[5] A47C *27/08*

U.S. Cl. 5—450 **23 Claims**



1. In a waterbed mattress: walls of film material defining a chamber for holding water, a cornerpiece which is substantially thicker than the film material joined to the film material and forming a corner of the mattress, an insert disposed in the chamber for reducing wave action in the water, and a thether connected between the insert and the cornerpiece to retain the insert in a predetermined position in the chamber.

5,062,171

PATIENT SUPPORT AIR BAGS AND RELATED SYSTEM WITH CONNECTORS FOR DETACHABLE MOUNTING OF THE BAGS

John H. Vrzalik, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Division of Ser. No. 249,880, Sep. 27, 1988, abandoned, which is a continuation of Ser. No. 905,553, Sep. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 784,875, Oct. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 683,153, Dec. 17, 1984, abandoned. This application Mar. 12, 1990, Ser. No. 493,107

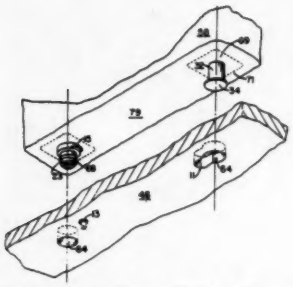
Int. Cl.[5] A61G *7/04*

U.S. Cl. 5—455 **7 Claims**

1. An air sac for use in a patient support system, comprising:

an inflatable enclosure for mounting transversely on a patient support system to support a portion of a patient;

a nipple secured to a bottom wall of said enclosure, said nipple being provided with a passage therethrough for enabling communicating of air to the interior of said enclosure;



a tab extending radially from said nipple for securing the nipple to an air supply; and

a post secured to the bottom wall of said enclosure in spaced relationship with said nipple, said post having an enlarged end for releasably engaging a keyslot.

5,062,172

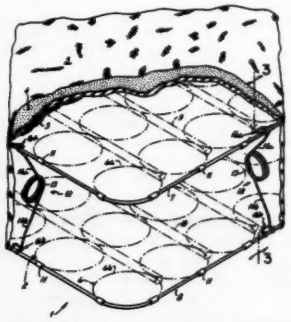
BEDDING MATTRESS SPRING ASSEMBLY HAVING BORDER EDGE SUPPORT

Ralph D. Stewart, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jul. 30, 1990, Ser. No. 559,356

Int. Cl.[5] A47C *23/00*

U.S. Cl. 5—474 **4 Claims**



1. A spring assembly for use in a bedding mattress, said spring assembly including lower and upper border wires, each having a substantially rectangular shape with two sides and two ends, said upper and lower border wires being parallel to one another, a plurality of rows of coil springs extending between said sides of said lower and upper border wires, each of said coil springs in said row being vertically oriented so a lowermost coil revolution of each coil spring is coplanar with said lower border wire and an uppermost coil revolution of each coil spring is coplanar with said upper border wire, endmost coil springs of said rows being located adjacent said lower and upper border wires and having the lowermost coil revolution joined to said lower border wire by a sheet metal clip and the uppermost coil revolution joined to said upper border wire by a sheet metal clip, said rows of coil springs having adjacent lowermost and uppermost coil revolutions joined together by a plurality of parallel helical lacing wires, and a plurality of edge support springs mounted between said upper and lower border wires, said edge support springs being secured to said border wires without the use of any sheet metal clips, each of said edge support springs comprising a single strand of wire having two ends and a torsion coil intermediate said ends of said strand of wire, one of said ends of said strand or wire being secured to said upper border wire and the other end of said strand of wire being secured to said lower border wire, each end of said strand of wire having an open U-shaped channel formed therein, said U-shaped channel having two, horizontally oriented, inwardly open, parallel U-shaped sections interconnected by a connecting portion of said single strand of wire, each of said edge support springs being secured to said upper and lower border wires by securement of said upper and lower border wires within said U-shaped channels of said edge support springs.

5,062,173

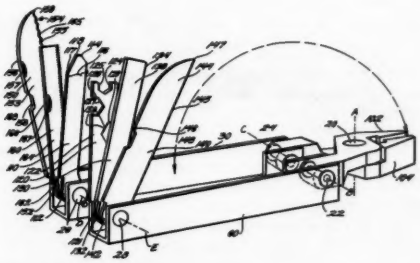
MULTIFUNCTION TOOL

Michael C. Collins, 3075 Batesville Rd., Woodstock, Ga. 30188, and Walter W. Collins, P.O. Box 100, North, S.C. 29112

Continuation-in-part of Ser. No. 430,781, Nov. 2, 1989, abandoned. This application Jul. 5, 1990, Ser. No. 550,798

Int. Cl.[5] B26B *11/00*

U.S. Cl. 7—118 **13 Claims**



1. A tool comprising:

a left pliers;

a right pliers;

a first pivot means for pivotally interconnecting said left and said right pliers so that said left pliers and said right pliers can cooperatively hold an object therebetween, said left and said right pliers pivoting about a first axis;

a left handle having a first recess dimensioned to receive said left pliers;

a second pivot means for pivotally attaching said left handle to said right pliers, said right pliers and said left handle pivoting about a second axis perpendicular to said first axis;

a right handle having a second recess dimensioned to receive said right pliers;

a third pivot means for pivotally attaching said right handle to said left pliers, said left pliers and said right handle pivoting about a third axis perpendicular to said first axis and aligned with said second axis so that said left and said right pliers rotate together about said second and said third axes, respectively, from a fully extended position to a fully retracted position whereby said left pliers is received into said first recess of said left handle and said right pliers is received into said second recess of said right handle;

said left and said right pliers openable and closable by separating and bringing together said left and said right handles,

said left and right pliers cooperating to hold said object over a range of positions between said fully extended position and near said fully retracted position; and

latching means for holding said left handle and said right handle together when said left and said right pliers are in

said retracted position in said left and right handles, respectively,

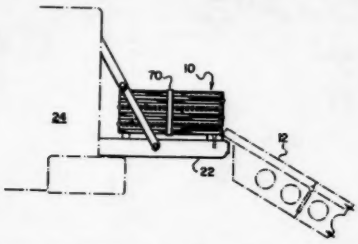
said latching means unlocking when said left and said right pliers are rotated to the extended position.

5,062,174

PORTABLE RAMP

Stanley A. DaSalvo, R.R. #1, Lombardy, Ontario, Canada K0G 1L0

Filed Aug. 30, 1990, Ser. No. 574,802
Claims priority, application Canada, Aug. 30, 1989, 609,937
Int. Cl.[5] E01D *1/00*
U.S. Cl. 14—69.5 **3 Claims**



1. A portable lightweight folding ramp consisting essentially of in combination:

(i) a plurality of ramp panels, each having a top surface, a bottom surface, lateral side edges, and longitudinal side edges;

(ii) a plurality of support panels, each of which has longitudinal side edges and lateral side edges;

(iii) first hinge means, foldably connecting together the lateral edges of adjoining ramp panels at adjoining lateral edges, the first hinge means being adapted and constructed such that:

(a) when the ramp is in the open position, the ramp panels are coplanar; and

(b) when the ramp is in the stored position, pairs of top surfaces and bottom surfaces are alternately folded against each other, so that the bottom surface of one panel is parallel to the top surface of the next adjacent panel;

(iv) second hinge means adjacent the ramp panel longitudinal edges foldably connecting longitudinal side edges of at least two support panels to each ramp panel, the second hinge means being adapted and constructed such that:

(a) when the ramp is in the open position, the support panels are co-planar and substantially normal to the ramp panels; and

(b) when the ramp is in the stored position, the support panels are co-planar with the ramp panels, and

(v) third hinge means foldably connecting pairs of lateral edges of the support panels adjacent the ramp panel lateral edges, the third hinge means being adapted and constructed so that when the support panels are folded to be co-planar with the ramp panels, the ramp can be folded into its stored position.

5,062,175

WINDSHIELD WIPER WITH ADJUSTABLE WIPING PRESSURE

Harry C. Buchanan, Spring Valley, and Keith R. Victor, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 16, 1990, Ser. No. 523,952
Int. Cl.[5] A47L *1/02, 1/00*
U.S. Cl. 15—103 **2 Claims**

2. In a vehicle having a windshield, a windshield wiper with adjustable wiping pressure, comprising,

a wiper drive shaft,

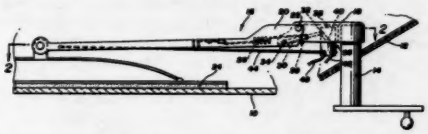
a base fixed to said wiper drive shaft above said windshield,

a wiper arm pivoted to said base so as to pivot toward and away from said windshield about a main pivot axis,

a wiper blade mounted to said wiper arm so as to engage said windshield with a wiping pressure dependent upon the torque on said wiper arm as measured about said main pivot axis,

a lever pivoted to said base so as to pivot up or down about a secondary pivot axis located below said main pivot axis,

a tension spring having one end fixed to said wiper arm and another end fixed to said lever, so that, when said lever is held in a stable position relative to said base, said spring pulls said wiper arm down about said main pivot axis toward said windshield with a moment arm,



a mechanical actuator movably mounted to said base and adapted to pivot said lever up or down about said secondary axis as said actuator is moved relative to said base between a pair of stable limit positions where the spring line of force is located above and below said secondary axis respectively, thereby establishing lesser and greater moment arms relative to said main pivot axis corresponding to lesser and greater torques on said wiper arm about said main pivot axis, and,

thermally responsive shape memory means adapted, when selectively heated, to move said mechanical actuator far enough to move said lever between said limit positions,

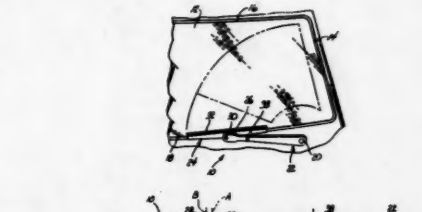
whereby, greater or lesser wiping pressures may be applied to said wiper blade by selectively heating said thermally responsive shape memory means.

5,062,176

WIPER WITH SELF COMPENSATING BLADE PARK POSITION

Ralph J. Unterborn; Michael J. McClain, both of Dayton, and Mark M. Benner, Xenia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1991, Ser. No. 683,906
Int. Cl.[5] B60S *1/44, 1/40*
U.S. Cl. 15—250.23 **2 Claims**



1. A wiper for use on a vehicle having a windshield with a pair of edges that define ideal wipe pattern limits of an ideal wipe pattern in which one of two normal wipe pattern limits, in a normal wipe pattern located within said ideal wipe pattern, is not substantially parallel to one of the windshield edges, said

vehicle also having a park mechanism adapted to move said wiper forcefully to a park position beyond said one normal wipe pattern limit, said wiper comprising,

an elongated wiper arm, pivoted at one end to a wiper post, adapted to be oscillated over said windshield through said normal wipe pattern,

a wiper blade and support pivoted to said wiper arm so as to rotate relative thereto about a main axis and to wipe said windshield when maintained in a fixed angular relationship to said wiper arm, and,

an elongated buckling member having an outer end rotatably joined to said blade support about a secondary axis located outwardly, with respect to said wiper post, of said main axis, so that rotation of said wiper blade support about said main axis causes said secondary axis to swing about said main axis, said buckling member also having an inner end fixed to said wiper arm inwardly, with respect to said wiper post, of said main axis so as to maintain said wiper arm and blade support in said fixed angular relationship when said buckling member is in a flat, unstressed condition, and,

a stop member engageable with said wiper blade support when said wiper is moved to said park position so as to apply a torque to said wiper blade support about said main axis sufficient to swing said secondary axis about said main axis and move said buckling member outer and inner ends together to buckle said buckling member out of its flat condition,

whereby, when said wiper arm is moved to said park position, said blade support can rotate out of said fixed angular relationship and move substantially parallel to said one windshield edge, said buckling member returning to its unstressed condition as said wiper arm is again moved away from park position, thereby rotating said wiper blade support back to its fixed angular position.

5,062,177

BRUSH HEAD FOR DEBURRING AND BRUSHING MACHINES

Reinhard Huhmann, Gummersbach, Fed. Rep. of Germany, assignor to RSA Entgrat-Technik Rainer Schmidt, Fed. Rep. of Germany

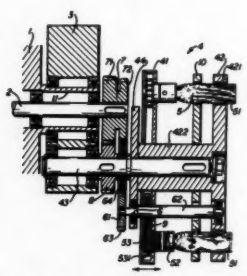
PCT No. PCT/DE88/00325, § 371 Date Feb. 16, 1990, § 102(e) Date Feb. 16, 1990, PCT Pub. No. WO89/00480, PCT Pub. Date Jan. 26, 1989

PCT Filed Jun. 3, 1988, Ser. No. 459,772

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723602

Int. Cl.[5] A47L *15/00*

U.S. Cl. 15—88.2 **7 Claims**



1. Brush head (4) for deburring and brushing machines, comprising:

a base plate (41) rotatingly connected to a working shaft (43),

several fingerlike brushes (5) held in said base plate (41), said brushes (5) being arranged parallel to said working shaft (43) and on a circle concentric to said working shaft (43);

means driving said base plate (41) by a planetary gearing (7,8) for autorotation about said working shaft (43), and for a planetary motion on a circular orbit around a drive shaft (2) of the machine;

each fingerlike brush (5) being rotatably associated with said base plate (41); and

means driving the fingerlike brushes with a rotational speed whose maximum ratio relative to the speed of autorotation of said base plate (41) is about 1:50.

5,062,178

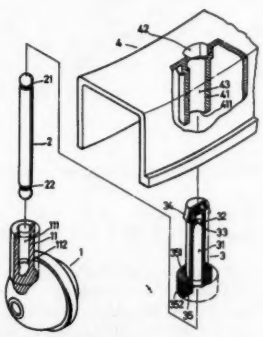
WHEEL UNIT FOR A SLIDABLE INFANT CHAIR

Hsiu-Hui Chiu, Tainan Hsien, Taiwan, assignor to Sunshon Molding Co., Ltd., Tainan Hsien, Taiwan

Filed Dec. 11, 1990, Ser. No. 625,468

Int. Cl.[5] B60B *33/00*

U.S. Cl. 16—38 **2 Claims**



1. A wheel unit for coupling a wheel to a frame of a displaceable infant chair comprising:

(a) a vertically extending rod cap member having a vertically directed outer side wall defining a closed upper end section having a pair of opposingly located U-shaped elastic fragment elements biased outwardly from said rod cap member outer side wall, said rod cap member further defining an open lower end section having a flanged annular member secured to said rod cap member side wall at a lower end thereof, said flanged annular member having a serrated side wall and a serrated upper surface;

(b) a vertically directed fixing sleeve member having a through opening, said fixing sleeve member secured to said frame of said infant chair at an upper end and having a lower end including a lower sleeve serrated surface for mating engagement with said serrated surface of said flanged annular member when said rod cap member is inserted within said sleeve member through opening, said U-shaped fragment elements being (1) radially compressed in sliding contact with an inner wall of said fixing sleeve member when said rod cap member is inserted within said through opening of said fixing sleeve member and (2) expanded beyond a diameter of said fixing sleeve member through opening when said upper end section of said rod cap member has passed through said fixing sleeve through opening for releaseably coupling said rod cap member to said fixing sleeve; and,

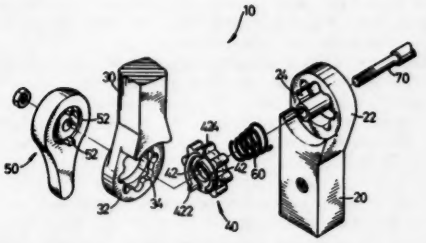
(c) a vertically extending rod member releaseably insertable within said rod cap member and a rod supporter member secured to said wheel for releaseably coupling said wheel to said rod cap member, said fixing sleeve and said frame of said infant chair, said rod member having upper and lower grooves for respectively mating with flange ring members formed within said rod cap member and said rod supporter member.

5,062,179

HANDLE ASSEMBLY FOR DOLL CARRIAGES

Ming-Tai Huang, 4Fl., No. 302, Pai Ling Wu Rd., Taipei, Taiwan

Filed Mar. 11, 1991, Ser. No. 667,272
Int. Cl.[5] F16C *11/00*; E05D *11/10*
U.S. Cl. 16—111 R 4 Claims



1. In a handle assembly for a doll carriage of the type comprising a pair of support rods each having a first pivot head defining a cog seat; a substantially U-shaped handle having a pair of second pivot heads each defining a second cog seat; a spring-biased cog member disposed between the first and second cog seats, the cog member being constantly biased by a spring to assume an engaged position where the U-shaped handle is prevented from a pivotal movement with respect to the support rods, and being urgeable to assume a released position where the U-shaped handle is pivotal with respect to the support rods; and an adjusting piece operable to move the cog member from the engaged position to the released position, the improvement comprising:

said cog member having a pair of annular wedges diametrically spaced from each other; and

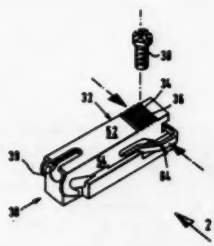
said adjusting piece having a pair of ridges on a side opposite to said cog member, each said ridge being constantly in contact with a corresponding annular wedge so that said ridges track along a respective slanted surface of said annular wedges in response to a rotational movement of said adjusting piece, thereby urging said cog member from the engaged position to the released position while simultaneously preventing said spring-biased cog member from assuming the engaged position.

5,062,180

MOUNTING PLATE FOR CABINET HINGES

Karl Lautenschläger, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

Filed Jun. 20, 1990, Ser. No. 541,255
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1989, 8907480[U]
Int. Cl.[5] E05D *7/04, 7/12*
U.S. Cl. 16—257 18 Claims



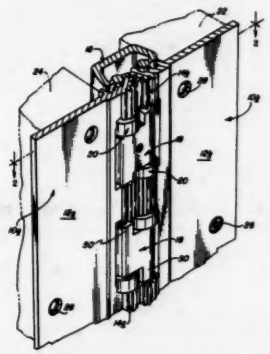
1. Mounting plate for the adjustable mounting of the supporting wall-related part of a cabinet hinge, which is composed of two separable mounting plate members, of which the bottom mounting plate member nearer the supporting wall can be fastened fixedly to the supporting wall and the upper mounting plate member, which is farther from the supporting wall and adjustably holds the carcase-related member of the cabinet hinge, can be fastened by a resilient catch mechanism to the bottom mounting plate member, the bottom mounting plate member having in its front end portion adjacent the door leaf at least one hook projection with which a hook on the bottom of the upper mounting plate member is associated, and the associated engagement surfaces of the hook projection and hook being configured in a complementary manner and being approximately arcuate at least in sections, and the upper mounting plate member partially overlapping the bottom mounting plate member at least in its end portion pointing into the carcase interior and being provided in the overlapping portion with two tongues which are resiliently flexible parallel to the supporting wall surface and have each a catch section, which catch sections are interlocked each with an associated catch receiver, and the catch sections and the catch receivers being able nevertheless to be brought out of engagement by flexing the tongues against one another parallel to the supporting wall surface, and each tongue having a finger grip that is accessible when the two mounting plate members are in the coupled state for the exertion of a pressure directed against one another parallel to the supporting wall surface, characterized in that the catch sections (74, 174, 274) provided on the resiliently flexible tongues (64, 164, 264) and the associated catch receivers run at an angle between 30° to 60° with respect to the longitudinal central axis of the mounting plate (30).

5,062,181

CONTINUOUS HINGE WITH IMPROVED BEARING DESIGN

Louis G. Bobrowski, Berlin, and Richard H. Kon, Avon, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Feb. 12, 1991, Ser. No. 654,735
Int. Cl.[5] E05D *1/00*
U.S. Cl. 16—354 24 Claims



1. An extruded hinge with a multiplicity of bearing assemblies spaced along its length an comprising:

(a) a pair of abutting hinge leaves each having a mounting portion and a pivot portion extending along the abutting edge, said pivot portions having convexly arcuate surfaces with intermeshing gear teeth extending along the length thereof and channels in their opposite surfaces, said hinge leaves having a multiplicity of pairs of opposed cooperating cutouts extending through said pivot portions into said mounting portions, the cutouts of each pair being axially offset to provide a center portion in which the cutouts are aligned and recesses at the axial ends thereof in opposite hinge leaves;

(b) an elongated lateral bearing member of generally C-shaped cross section providing an axially extending cavity

therewithin and opposed flanges at its free ends, said cavity receiving said pivot portions and said flanges extending into said channels of said pivot portions to lock said hinge leaves with their pivot portions in intermeshing engagement, said hinge leaves being pivotable relative to each other about their abutting geared surfaces within said cavity of said lateral bearing member;

(c) a bearing block in each of said cutouts of said hinge leaves and within said cavity, said block having an axially extending body portion seated in the aligned center portion of said cutouts and of lesser length than said center portion, said block also having axially projecting portions at each end disposed within said recesses defined by said cutouts, said block having channels along its sides in which are seated said flanges of said elongated lateral bearing member; and

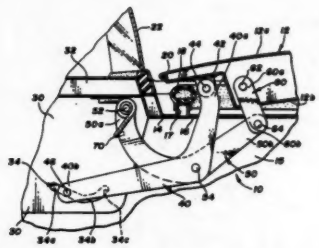
(d) bearing caps at the ends of said bearing block disposed within said cavity between the ends of the body portion thereof and the adjacent pivot portions of said leaves, said bearing caps being engaged with their respective pivot portions and pivotable therewith, said caps extending beyond the teeth of the pivot portion upon which secured and beyond the teeth of the opposed pivot portion.

5,062,182

THREE LINK, SIX POINT HINGE ASSEMBLY FOR DECK LID

Guy G. V. Griffiths, Cheylesmore Coventry, England; James Bolsworth, Sterling Heights, and John M. Appleby, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 16, 1990, Ser. No. 465,867
Int. Cl.[5] E05D *15/00*
U.S. Cl. 16—368 **7 Claims**



1. In an automotive vehicle having rear body structure whose upper periphery defines an access opening to a trunk compartment,

a compressible elastomeric seal means carried by said upper periphery of said body structure,

a deck lid for said access opening,

and a pair of laterally spaced hinge assemblies connected with said deck lid adjacent its front end and pivotally connected with said rear body structure adjacent said front end of said deck lid,

said hinge assemblies swingably supporting said deck lid for movement between an open position to afford access to said compartment and a closed position in which said deck lid compresses said seal means and closes off access to said compartment, the improvement being that said hinge assemblies each comprise a linkage means including a three link, six pivot linkage arrangement operatively pivotally connected to said deck lid and operatively both pivotally and slidably connected to said body structure, said linkage arrangement comprising a first link having one end pivotally connected via a first pivot means to said deck lid adjacent its front end and its other end pivotally and slidably connected by a second pivot means to a support member on said body structure located adjacent the front end of said deck lid,

said support member on said body structure having a non-linear slot extending longitudinally of said vehicle and whose intermediate portion is lower than its first and second opposite ends, as viewed in side elevation, said second pivot means being pivotally and slidably received in said slot,

a second link pivotally connected intermediate its ends to said first link at a location intermediate the opposite ends of said first link via a third pivot means,

said second link at one end being pivotally connected via a fourth pivot means to said support member,

a third link having one end pivotally connected via a fifth pivot means to said deck lid at a location spaced further rearwardly than said first pivot means and its other end pivotally connected via a sixth pivot means to the second link at its end remote from said fourth pivot means,

said second pivot means being located adjacent said first end of said slot when said deck lid is in its closed position,

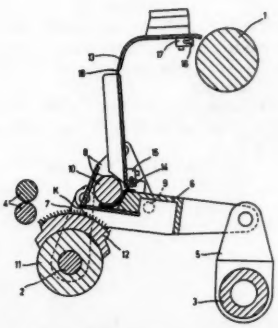
said linkage arrangement and said slot in said support having a configuration such that, when the deck lid is being initially moved from its closed position toward an open position, the deck lid is caused to be rapidly moved vertically upward from said seal means with only a very little pivotal movement until the front end of the deck lid clears said seal means whereby the exertion of transverse forces against said seal means due to any wiping action of said deck lid as it is being initially moved to its open position is minimized.

5,062,183

LAP FEED PLATE CONNECTED TO OSCILLATING NIPPERS IN A COMBING MACHINE

Gian-Carlo Mondini, and Walter Ackeret, both of Winterthur, Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Jul. 11, 1990, Ser. No. 550,998
Claims priority, application Switzerland, Jul. 20, 1989, 2711/89
The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.
Int. Cl.[5] D01G *19/16*
U.S. Cl. 19—225 **13 Claims**



1. A lap feed plate connected to oscillating nippers in a combing machine having a frame, and effective to guide the lap to be combed which is fed to a feed roller mounted in the nippers, wherein said lap feed plate includes a single sheet of plastic and has a first edge connected to the oscillating nippers and a second edge connected to an element secured to said frame and disposed near a lap roller of the combing machine, and wherein said lap feed plate has a reduced thickness between said two edges in at least one linear bend zone which extends substantially parallel to said edges and over the entire

width of the plate, said reduced thickness allowing said nippers to oscillate at a high combing cycle rate.

5,062,184

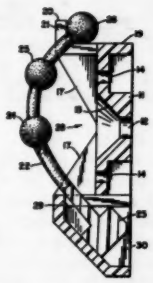
CLIP FOR HOLDING ELONGATED DEVICES

David E. Rowland, San Diego, Calif., assignor to Janice L. Rowland, Imperial Beach, Calif.

Continuation-in-part of Ser. No. 363,609, Jun. 8, 1989, and Ser. No. 375,664, Jul. 8, 1989, each is a continuation-in-part of Ser. No. 176,670, Apr. 1, 1988, abandoned. This application Aug. 31, 1990, Ser. No. 575,867

Int. Cl.[5] B65D *63/00*

U.S. Cl. 24—16 PB **10 Claims**



1. A clip for holding elongated devices, comprising:

a base,

a first and second projections each of which projects outward from and transversely to said base,

both of said projections extending away from said wall in the same general direction,

each of said projections defining a cavity through which said elongated device may pass,

said projections being spaced from each other to thereby provide a space between said cavities,

said cavities being in general alignment with each other so that the elongated device may be positioned to extend through both cavities as well as the space between said cavities, and

means for firmly holding an elongated device that extends through and between said cavities comprising an elastic stretchable elongated member that extends transverse to an elongated device located in and between said cavities and which presses against the elongated device to hold it in place,

said elastic stretchable elongated member having at least two enlargements that are spaced from each other, one of which enlargements is positioned adjacent one side of an elongated device that extends through and between said cavities and the other of which enlargements is positioned adjacent the other side of the elongated device that extends through and between said cavities,

said means including connecting means on said base for connecting one of said enlargements of said elongated member to said base and for removably connecting the other of said enlargements of said elongated member to said base.

5,062,185

CONCEALED TIE CLASP

Roy T. Howard, 973 Acacia Ave., Sacramento, Calif. 95815

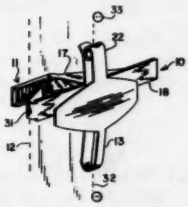
Filed Nov. 29, 1990, Ser. No. 619,598

Int. Cl.[5] A41D *25/04*

U.S. Cl. 24—49 CC **4 Claims**

1. A device for securing to the vertical buttonhole edge of a shirt the front and rear pendant panels of a four-in-hand necktie wherein the rear surface of said front panel has a horizontally disposed designer label loop, said device comprising:

a) clip means for engaging said button hole edge and comprised of a horizontally elongated lever having interior and outer surfaces, a horizontally elongated base member having interior and outer surfaces and a retaining elbow, pivot means which interengage said lever and base member, and a spring associated with said pivot means and serving to urge said lever and base member together so



that said interior surfaces are in facing and abutting juxtaposition, and

b) an elongated constraining loop for engaging said label loop, disposed upon the outer surface of said base member, having an opening therein, and centered upon a vertical axis orthogonal to said base member and laterally spaced about ⅛ inch from said retaining elbow.

5,062,186

QUICK-SEALING DESIGN FOR RADIOLOGICAL CONTAINMENT

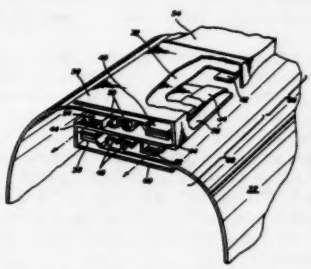
Donald S. Rampolla, Pittsburgh, and Elmer Speer, Ruffsdale, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 118,084, Nov. 9, 1987, Pat. No. 4,914,793. This application Jan. 23, 1990, Ser. No. 469,652

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] A44B *19/32*

U.S. Cl. 24—389 **4 Claims**



1. A sealing assembly suitable for joining two elongated edges of flexible sheet material to form a hermetic barrier in the plane of said flexible sheet material, comprising:

an elongated slide zipper type mechanical fastener having elongated edges and opposing engaging members affixed at a predetermined distance from each of said elongated edges, the respective elongated edges overlapping upon engagement of said mechanical fastener to form first and second flaps;

a first adhesive layer formed along the elongated edge of said first flap;

a second adhesive layer formed along the elongated edge of said second flap;

a slide zipper having an inverted block "S" cross-sectional configuration including an upper plate, a center plate running along a portion of the slide terminating in a back edge which is configured to permit peel-off strips to slide smoothly over said back edge, and a lower plate, and a

longitudinal configuration having a head portion and a tail portion, the head portion being sufficiently wide to accommodate said adhesive layers and the upper and lower plates extending past the center plate and necking down to form the tail portion of the slide; and

peel-off strip means formed over each of said first and second adhesive layers prior to the formation of said barrier such that the slide zipper does not contact the adhesive layers;

whereby said mechanical fastener and said first and second flaps combine along the adhesive layers thereof with opposite sides of said center plate to form said hermetic seal.

5,062,187

INTERNAL CUTTING HEAD FOR DRIFTING PIPE

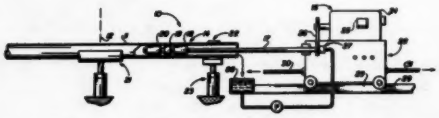
Scott Bromley, Lovington, N. Mex., assignor to Scott Tech International, Inc., Lovington, N. Mex.

Continuation-in-part of Ser. No. 413,540, Sep. 27, 1989, Pat. No. 4,954,023. This application Aug. 30, 1990, Ser. No. 575,263

The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.

Int. Cl.[5] B23B *47/00*

U.S. Cl. 29—33 T **38 Claims**



1. Method of removing irregularities from the inside of a pipe section, comprising the steps of:

mounting a cutter device on a mandrel; connecting one end of said mandrel to a rotatable shaft which can be moved axially along the interior of the pipe section;

mounting a first and second alignment device on said mandrel in spaced relationship respective to one another; connecting said cutter device to be rotated by said mandrel; mounting the cutter device between the alignment devices;

rotatably mounting each said alignment device in journaled relationship respective to said mandrel, forming radially active pistons which are reciprocatingly received within a piston receiving chamber in said alignment device; connecting said piston receiving chambers to a common source of pressure to concurrently extend the pistons of an alignment device into contact with the inner wall of the pipe section to engage the inner pipe wall with said pistons and thereby resist rotation of said alignment device while permitting said cutter device to be moved axially within the pipe section;

rotating the shaft while moving the shaft axially through the pipe section to cut the inner wall surface along the length of a pipe section with the cutter device and thereby provide the pipe section with a minimum inside diameter.

5,062,188

TRANSFER APPARATUS FOR MOVING PALLETS USING HYDRAULIC LIFT

Joel W. Jones, and John Eldracher, both of Windsor, Canada, assignors to Tri-Way Machine Ltd., Windsor, Canada

Filed Jan. 14, 1991, Ser. No. 640,829

Int. Cl.[5] B23Q *7/00*; B65G *47/00*

U.S. Cl. 29—33 P **24 Claims**

1. For use with an automated machine tool assembly in which a plurality of work stations are interconnected by slide rails on which can slide a pallet to which a workpiece is affixed, and at least one transfer bar with means for engaging the pallet and sliding the pallet the slide rails longitudinally thereof, a hydraulic lift and monitoring system which comprises:

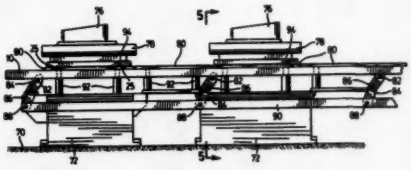
a plurality of hydraulic cylinders provided as part of said transfer bar,

in each cylinder a plunger of which a portion extends above the top of the transfer bar and is adapted to contact a pallet,

a first source of fluid under pressure,

conduit means ducting fluid from said first source to all said cylinders, said fluid acting to urge the plungers upwardly,

a second source of fluid under pressure,



pressure detecting means,

passageway means linking said second source through all said cylinders in series and finally to said pressure detecting means in such a way that, when all the plungers are at or above a predetermined vertical position, pressurized fluid from said second source is available at the pressure detecting means, and when one or more plungers fail to reach said predetermined vertical position, pressurized fluid from said second source fails to reach said pressure detecting means.

5,062,189

DEVICE FOR PROFILING AN ELECTRODE ROLLER

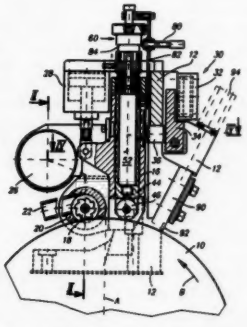
Hans Aebersold, Birmensdorf, Switzerland, assignor to Elpatronic AG, Zug, Switzerland

Filed Mar. 12, 1991, Ser. No. 668,076

Claims priority, application Switzerland, May 2, 1990, 01484/90

Int. Cl.[5] B23P *6/00*; B23C *3/12*

U.S. Cl. 29—33 R **6 Claims**



1. A device for profiling an electrode roller, with

a tool slide which can be moved approximately radially backwards and forwards in relation to the electrode roller by means of a feed drive, and

at least one profiling tool which is mounted on the tool slide, characterized by

a feeler slide which carries a feeler which can move parallel to the tool and is biassed towards the electrode roller,

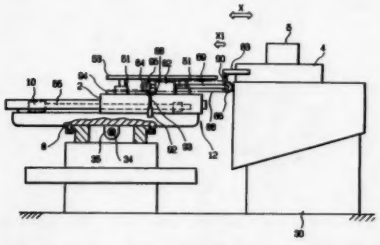
an adjustable limit stop which limits the relative movement of the tool slide in relation to the feeler slide, and which thus limits the depth of feed of the profiling tool into the electrode roller, and

a clamping device with which the tool slide can be stopped as soon as the preset depth of feed of the profiling tool has been reached.

5,062,190
PALLET CHANGER

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Toyama, Japan

Continuation of Ser. No. 434,674, Oct. 27, 1989, Pat. No. 4,996,754. This application Oct. 2, 1990, Ser. No. 591,827
Claims priority, application Japan, May 7, 1987, 62-109837
The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.
Int. Cl.[5] B23Q 7/00; B65G 47/00
U.S. Cl. 29—33 P 10 Claims



1. A pallet changer for a machine tool which employs pallets for supporting workpieces, said pallet changer comprising:

(A) a support;

(B) a table for mounting at least one of said pallets such that a pallet mounted on said table is movable along said table, said table being supported by the support and movable along a first axis;

(C) pallet holding means for holding at least one of said pallets, said pallet holding means being positioned near the support so that pallets are transferrable between said pallet holding means and said table;

(D) driving means for moving the table between the machine tool and the pallet holding means along said first axis;

(E) transfer means for moving a pallet movably mounted on the table in a first direction along the first axis or a second direction along the first axis opposite to said first direction by means of a driving force of said driving means as the table moves in the first direction or the second direction, said transfer means comprising:

(i) a guide body fixed to the table;

(ii) a slide body slidable along said first axis and supported by the guide body;

(iii) a first sprocket positioned on a first portion of the slide body and a second sprocket positioned on a second portion of the slide body;

(iv) a chain arranged between the first sprocket and the second sprocket; and

(v) first engagement means for detachably engaging the chain and the pallet movably mounted on the table; and

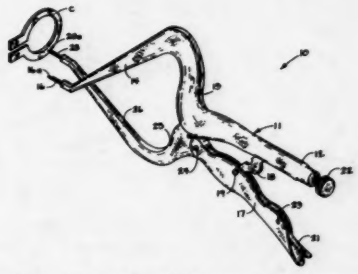
(F) chain moving means for moving the chain whereby the slide body slides relative to the table in said first direction or said second direction and the pallet movably mounted on the table slides in said first direction or said second direction as the table moves in said first direction or said second direction, said chain moving means comprising a pinion connected to the slide body, a rack for engagement of the pinion fixed to the table, and second engagement means for engaging the chain as one of said pallets is transferred between the table and the pallet holding means;

wherein said transfer means moves the pallet movably mounted on the table in the first or second directions only from the driving force of said drive means.

5,062,191
LOCKING RING TOOL

Luther J. Carr, P. O. Box 51, Road 1002, Hessel, N.C. 27841

Filed Oct. 9, 1990, Ser. No. 594,419
Int. Cl.[5] B23P 19/04
U.S. Cl. 29—229 1 Claim



1. A locking ring tool comprising, in combination,

a fixed leg, including a first leg portion, with a second leg portion orthogonally mounted at a forward end of the first leg portion, with a third leg portion integrally mounted at a first acute included angle between the second leg portion and the third leg portion, and

a first support pin mounted at a forward terminal end of the first leg portion, and

a first pivot leg pivotally mounted to a second pivoted leg, with the second pivot leg mounted to the fixed leg, and

the second pivot leg including a projecting leg defining a second acute included angle between the projecting leg and the second pivot leg, and

a second support pin fixedly mounted to a forward terminal end of the projecting leg, with the second support pin positioned coextensive, contiguous, and parallel with the first support pin in a first position, and spaced from the first support pin in a second position, and

wherein the second pivot leg is pivotally mounted to the fixed leg at a junction defined by the first leg portion and the second leg portion, and

wherein the first support pin is arranged parallel to the first leg portion, and

wherein the second pivot leg is aligned with the second leg portion in a first position, with the second pivot leg defining a further acute angle between the second leg portion and the second pivoted leg in the second position, and

wherein the first pivot leg includes an adjusting link, with the adjusting link including an adjusting link pivot pivotally mounting the adjusting link rearwardly of the second pivot leg, and the adjusting link including an arcuate rear terminal end spaced from the first pivot leg cooperatively positioned within the first leg portion to cooperate with a forward terminal end of an adjusting screw threadedly mounted within a terminal end of the first leg position.

5,062,192
CABLE STRIPPING TOOL

Alan G. Sawyer, 6346 Beulah Church Rd., Liberty, N.C. 27298; Dale L. Hughes, 1505 McCuiston Dr., Burlington, N.C. 27215, and Edwyn H. Petree, Burlington, N.C., assignors to Alan G. Sawyer, Liberty and Dale L. Hughes, Burlington, both of, N.C.

Division of Ser. No. 399,744, Aug. 28, 1989, Pat. No. 5,009,006.
This application Feb. 1, 1991, Ser. No. 649,671
Int. Cl.[5] H02G 1/12
U.S. Cl. 29—426.4 3 Claims

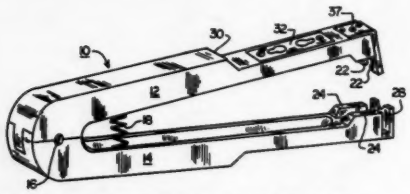
1. A method for stripping insulation or sheathing from a cable having at least one conductor, comprising the step of, seriatim:

(a) moving a pair of opposed, substantially rigidly mounted cutting blades in a tangential path with respect to the

cable, said blades being mounted at a predetermined distance with respect to one another;

(b) contacting opposite sides of the cable;

(c) continuing through at least a portion thereof of the insulation or sheathing, thereby scoring the insulation or sheathing on opposite sides;



(d) passing the cutting blades clear of the cable;

(e) making longitudinal cuts in the insulation or sheathing of the cable; and

(f) removing the insulation or sheathing from the cable.

5,062,193

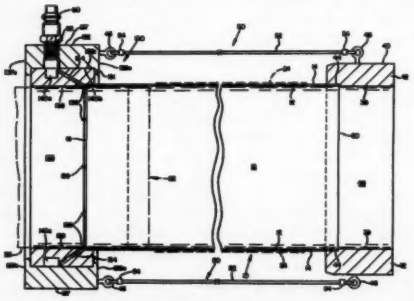
METHOD FOR MOUNTING AND DISMOUNTING RIGID SLEEVES ONTO AND FROM A CYLINDER

William L. Thompson, Vancouver, Wash., assignor to International Composites Corporation, Vancouver, Wash.

Continuation-in-part of Ser. No. 293,131, Jan. 3, 1989, Pat. No. 4,979,278. This application Jan. 3, 1990, Ser. No. 460,362

Int. Cl.[5] B23P *19/00*

U.S. Cl. 29—426.6 **6 Claims**



1. A method for axially dismounting a rigid sleeve from a cylinder, said sleeve having a longitudinal dimension which is less than or equal to the longitudinal dimension of said cylinder, which comprises:

providing said sleeve and said cylinder, said sleeve having a first and a second end and being mounted onto said cylinder;

providing an external source of expansion fluid comprising two semicircular sections which are attachable and detachable from each other for facilitating engagement and disengagement of said external source of expansion fluid with said sleeve, said external source of fluid including a channel for introducing expansion fluid to the interior of said sleeve for expanding the diameter of said sleeve;

detaching said semicircular sections in preparation for installation of the same about said sleeve and cylinder;

attaching said semicircular sections together, with said sleeve contained therewithin, such that said channel is aligned with said sleeve and said cylinder to ensure that said expansion fluid will be introduced between said sleeve and said cylinder;

expanding the diameter of said sleeve by introducing said expansion fluid, from said external source of fluid to the interior of said sleeve; and

moving said sleeve axially from about said cylinder.

5,062,194

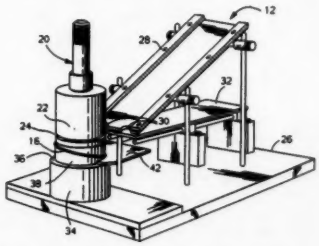
METHOD FOR INSTALLING O-RING SEALS

Joseph F. Mercurio, Birmingham, and Salvador Cantio, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1990, Ser. No. 612,155

Int. Cl.[5] B23P *19/02*

U.S. Cl. 29—451 **1 Claim**



1. A method of installing an elastic O-ring seal in a retention groove cut into a cylindrical outer surface of a part, said part outer surface having a predetermined diameter, said O-ring seal having a free state diameter less than said predetermined diameter comprising the steps of,

providing a cylindrical mandrel having a circular end face with a diameter substantially equal to said predetermined part outer surface diameter,

mounting said mandrel for close fitting axial sliding within a guide cylinder having an annular end edge such that said mandrel is axially movable from a loading position with its end face above said guide cylinder end edge to a release position below said end edge,

providing a feed ramp to feed said O-rings one at a time into a loading orientation adjacent to said mandrel end face and in which the plane of said O-ring is tilted away from and intersected by the plane of said mandrel end face,

providing a loading slide beneath the end of said feed ramp adapted to extend out past the end of said feed ramp and closely over said mandrel end face,

feeding an O-ring into said loading orientation when said mandrel is in said loading position,

extending said loading slide, thereby stretching said O-ring over said mandrel and below said end face,

abutting said part with said mandrel end face in its loading position with said part outer surface and mandrel end face concentric, and,

moving said mandrel to its release position while maintaining said part abutted with said end face,

thereby pushing said stretched O-ring off of said mandrel with said guide cylinder end edge and onto said part outer surface until said O-ring contracts into said retention groove.

5,062,195

MACHINING CENTER

Rolf Binder, Möchengladbach, Fed. Rep. of Germany, assignor to Werner und Kolb Werkzeugmaschinen GmbH, Berlin, Fed. Rep. of Germany

Filed Aug. 1, 1990, Ser. No. 560,610

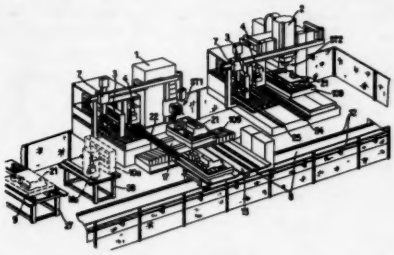
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1989, 3925568

Int. Cl.[5] B23Q *3/155, 7/00*

U.S. Cl. 29—568 **16 Claims**

1. A machining center, particularly for removal of material

from five sides of medium-sized and large workpieces, comprising a plurality of machines each having a material removing station with at least one tool spindle, at least one first mobile magazine for material removing tools and at least one



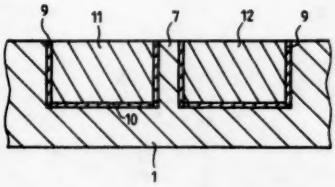
second mobile magazine for tool adapters; at least one manipulator operable to shuttle tools and adapters between said magazines and the tool spindles at the respective stations; and a common multiple-function transporting unit for workpieces and said magazines.

5,062,196

METHOD OF MANUFACTURING THE POLE PIECES AND THE GAP OF MAGNETIC HEADS IN THIN LAYERS

Patrice Deroux-Dauphin, Saint Egreve, France, assignor to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Aug. 27, 1990, Ser. No. 572,553
Claims priority, application France, Sep. 12, 1989, 89 11892
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 2 Claims



1. A method of manufacturing the pole pieces and the gap of magnetic heads in thin layers, starting from a silicon substrate, said method comprising the following steps:

a) forming an insulating layer on a silicon substrate;

b) depositing a metal layer on the insulating layer;

c) depositing a masking resin layer on the metal layer;

d) etching the substrate covered with the insulating layer and the metal layer to form wells bordering a bar of a determined width;

e) removing the left-over portion of the metal layer etched in the previous step;

f) thermo-oxidizing the etched substrate to develop a silicon oxide layer enabling the bar to be adjusted to obtain the desired gap;

g) selectively etching the oxide layer developed in the previous step in order to remove the parts of this layer that are located at the bottom of the wells;

h) depositing a conductive layer at the bottom of the wells;

i) electrolytically depositing a magnetic material in the wells; and

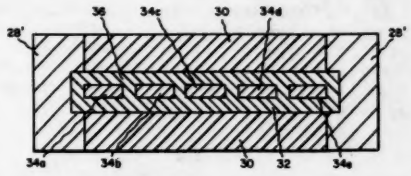
j) removing the left-over portion of the insulating layer initially deposited on the substrate.

5,062,197

DUAL-PERMEABILITY CORE STRUCTURE FOR USE IN HIGH-FREQUENCY MAGNETIC COMPONENTS

Richard J. Charles, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 290,078, Dec. 27, 1988, Pat. No. 4,943,793.
This application May 7, 1990, Ser. No. 519,997
Int. Cl.[5] H01F *41/02*
U.S. Cl. 29—606 20 Claims



1. A method of manufacturing a high-frequency magnetic circuit component, for use as an inductor or a transformer, having a closed-loop, dual-permeability magnetic pot core including therein a winding window which contains a plurality of planar conductors, comprising the steps of:

(a) machining a high-permeability ferrite to form a substantially cylindrical housing comprising an substantially cylindrical peripheral wall and a substantially cylindrical core post located in the interior of said cylindrical housing, said core post being concentric with said cylindrical wall;

(b) providing a temporary base for rigidly mounting said housing thereon;

(c) applying a first low-permeability layer above and adjacent to said temporary base;

(d) inserting at least one conductive winding into said housing, said winding lying above and adjacent to said first low-permeability layer;

(e) applying a second low-permeability layer above and adjacent to said winding; and

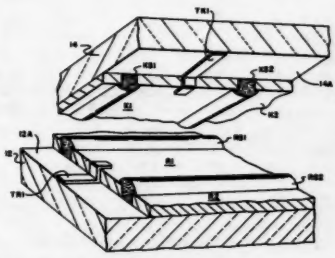
(f) removing said temporary base.

5,062,198

METHOD OF MAKING A TRANSPARENT TOUCH SCREEN SWITCH ASSEMBLY

Brian Y. Sun, Garland, Tex., assignor to Keytec, Inc., Richardson, Tex.

Filed May 8, 1990, Ser. No. 520,232
Int. Cl.[5] H01H *11/04*
U.S. Cl. 29—622 3 Claims



1. A method for making a touch-sensitive switch assembly comprising:

forming a plurality of conductive row strips on a side surface of an insulating substrate, with each pair of adjacent row

strips being separated by a longitudinally extending row channel, respectively;

forming a plurality of conductive column strips on a side surface of an insulating substrate, with each pair of adjacent column strips being separated by a longitudinally extending column channel, respectively;

filling each row channel with an insulating deposit until the deposit is enlarged slightly out of the channel, thereby forming a row spacer strip;

filling each column channel with an insulating deposit until the deposit is enlarged slightly out of the channel, thereby forming a column spacer strip; and,

mounting the first insulating substrate onto the second insulating substrate with the row conductors extending transversely with respect to the column conductors and with the row spacer strips engaging the column spacer strips, thereby defining an air gap between the row conductors and the column conductors.

5,062,199

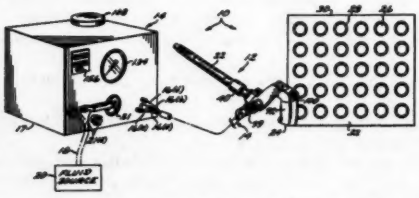
APPARATUS FOR RADIALLY EXPANDING AND ANCHORING SLEEVES WITHIN TUBES

John W. Kelly, La Canada, Calif., assignor to Haskel, Inc., Burbank, Calif.

Division of Ser. No. 463,367, Jan. 11, 1990, Pat. No. 5,009,002. This application Jan. 3, 1991, Ser. No. 637,156

Int. Cl.[5] B23P *15/26*

U.S. Cl. 29—727 **15 Claims**



1. An apparatus for radially expanding and anchoring a sleeve within a tube, which is contained within a bore in a surrounding structure having a primary side and a secondary side but extends axially beyond said secondary side of said structure, so as to repair a defective area of said tube and form a tight and substantially leakproof joint between said tube and sleeve, comprising:

a fluid source for supplying a first pressurized fluid and a second fluid;

a hydraulic expanding mandrel positioned axially within said sleeve, said mandrel having an elongated body with two axially separated seals, said mandrel and said sleeve together defining a substantially annular hydraulic pressure zone situated between said sleeve, said body and said seals with a certain portion of said pressure zone being situated beyond said secondary side, said mandrel being further connected to said fluid source and having a passage for conveying said second fluid to said pressure zone;

a first pump, which is linked to said fluid source and to said passage and pressurizes said second fluid upon being driven by said first fluid, said first pump further being preset so as to pressurize said second fluid and cause said second fluid to enter said pressure zone until said second fluid reaches a predetermined pressure which is above the radial yield point of said sleeve but below the aggregate radial yield point of said sleeve and tube, whereby said sleeve pre-expands into said tube substantially radially throughout said pressure zone;

a second pump, which is linked to said fluid source and said passage and pressurizes said second fluid upon being driven by said first fluid, said second pump being preset so as to pressurize said second fluid and cause a predetermined total volume of said second fluid to enter said pressure zone at a predetermined maximum pressure which is above said aggregate yield point, whereby said sleeve further expands substantially radially throughout said pressure zone and said tube expands substantially radially along with said sleeve; and

fluid control means for selectively activating said second pump after said sleeve has substantially pre-expanded into said tube and for controlling the total volume of said second fluid passage by said second pump through application of fluid stroke signals to said second pump, said control means being linked to said fluid source and being driven by said first fluid.

5,062,200

DEVICE FOR THE ASSEMBLY OF SMALL ELECTRICAL MACHINES

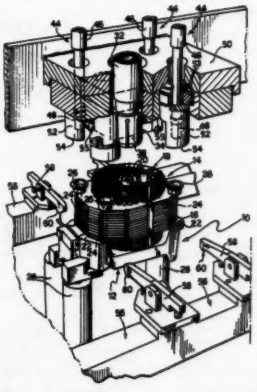
Antonello Lanfranco, Turin, Italy, assignor to Aspera S.r.l., Turin, Italy

Division of Ser. No. 411,533, Oct. 2, 1989, Pat. No. 5,010,638. This application Nov. 26, 1990, Ser. No. 617,753

Claims priority, application Italy, Apr. 1, 1987, 67257 A/87

Int. Cl.[5] H02K *15/14*

U.S. Cl. 29—732 **8 Claims**



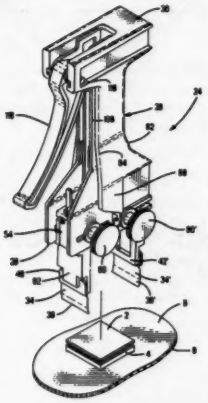
1. A device for assembling a stator comprised of a stack of core laminations (16) and stator windings (18), on to a respective head support (12) of a small rotary electrical machine, in a position concentric with a rotary shaft (20) mounted in the support (12), wherein the periphery of one end face of the stack (16) rests on the peripheral coplanar surfaces (22) of the support (12) which define a reference plane (P), and the stack (16) is traversed by peripheral bolts (24) situated in correspondence with the coplanar surfaces (22), perpendicular to these surfaces and which are screwed into the support, the device including means for supporting the support, a centering device (34) which can be interposed between the shaft (20) and the stack (16) and means (44) for tightening the bolts, characterised in that the device also includes thrust members (52) for clamping the stack (16) between the thrust members and the coplanar surfaces (22), before the bolts (24) are tightened and while the centering device (4) keeps the stack centered relative to the shaft (20), with clamping forces normal to the reference plane (P) and at least substantially equal to those predetermined tightening forces to be applied by the bolts on the stack.

5,062,201

INSERTION/EXTRACTION TOOL FOR SUBSTRATE PACKAGE

Alden O. Long, Jr., Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 7, 1990, Ser. No. 623,468
Int. Cl.[5] H05K *13/04, 3/30*
U.S. Cl. 29—741 19 Claims



1. An insertion-extraction tool for assembling a substrate package to, and disassembling a substrate package from, a socket which is mounted on a circuit board, the tool comprising:

a frame assembly, a yoke, spaced-apart yoke arms which extend from the yoke, first and second pairs of frame arms, and actuating means,

the yoke being in the frame assembly, the yoke arms being spaced-apart and extending beyond the frame assembly, the yoke arms having opposed first side surfaces and oppositely facing second side surfaces, the free ends of the yoke arms having gripping portions,

the first pair of frame arms being between the first side surfaces, the second pair of frame arms being proximate to the second side surfaces so that each yoke arm is between one first frame arm and one second frame arm,

the first frame arms being fixed to the frame assembly and having free ends which are between the yoke and the free ends of the yoke arms, the second frame arms being slidably mounted on the frame assembly for movement between extended positions and retracted positions, the second frame arms having free ends which are beyond the free ends of the yoke arms when the second frame arms are in their extended positions, and which are between yoke and the free ends of the yoke arms when they are in their retracted positions,

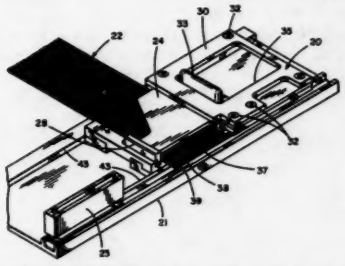
the actuating means being effective to move the yoke and the frame assembly relative to each other in directions parallel to the yoke arms and the frame arms whereby, the substrate package can be assembled to the socket by moving the second frame arms to their retracted positions, locating the substrate package on the socket with the substrate pins in alignment with the socket receptacles, locating the tool above the substrate with the free ends of the yoke arms between the surface of the circuit board and the underside of the socket and moving the frame assembly towards the free ends of the yoke arms by use of the actuating means whereby the free ends of the first frame arms will move against the substrate and push the substrate into assembled relationship with the socket, and the substrate can be disassembled from the socket by moving the second frame arms to their extended positions, locating the tool above the substrate with the free ends of the second frame arms on the surface of the circuit board and with the free ends of the yoke arms between the opposed surfaces of the substrate and the socket, and moving the yoke away from the free ends of the second frame arms by use of the actuating means whereby the yoke will pull the substrate from the socket.

5,062,202

TWISTED CABLE POSITIONING TRAY

Donald C. Wiencek, Tinley Park, and Robert J. Brown, Mokena, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Dec. 21, 1990, Ser. No. 632,225
Int. Cl.[5] H01R *43/01*
U.S. Cl. 29—749 5 Claims



1. A cable tray for positioning a multiconductor cable having a twisted longitudinal section in a connector application tool, comprising:

planar positioning means for accurately laterally positioning the multiconductor cable;

cable tray positioning means for positioning the cable tray relative to the connector application tool; and

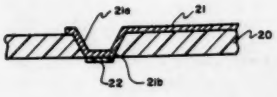
slide means for covering and securing the twisted multiconductor cable in an accurately aligned planar disposition on the planar positioning means after it has been initially placed on the cable tray positioning means, the slide means being mounted adjacent the planar positioning means to reciprocate between a first position extending fully across the width of the twisted cable and a second position completely retracted from the width of the twisted cable.

5,062,203

METHOD OF MAKING A FLEXIBLE MEMBRANE CIRCUIT TESTER

Brian S. Miller, Stafford, and David R. Kaplan, Burke, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 551,370, Jul. 10, 1990. This application Feb. 22, 1991, Ser. No. 658,805
Int. Cl.[5] H01K *3/10*
U.S. Cl. 29—852 1 Claim



1. A method of making a flexible membrane tester for a planar electrical circuit including the steps of:

preparing a frame to hold said membrane;

affixing a relatively thin flexible membrane to said frame;

depositing a removable layer on one side of said membrane;

forming a plurality of perforations through said membrane extending to said removable layer;

depositing a plurality of combination electrode and lead lines on the side of the membrane opposite to said removable layer such that each combination includes an electrode portion at the bottom of each perforation and in planar contact with said removable layer and a lead line portion extending through said membrane and in contact with said electrode and further extending to another region on said membrane;

removing said removable layer;

and forming a high-dielectric layer on the side of each electrode that was previously in contact with the removable layer.

5,062,204

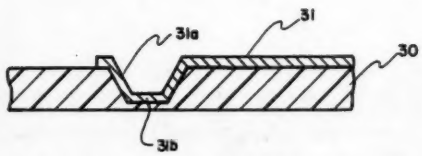
METHOD OF MAKING A FLEXIBLE MEMBRANE CIRCUIT TESTER

Brian S. Miller, Stafford, and David R. Kaplan, Burke, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 551,370, Jul. 10, 1990. This application Feb. 22, 1991, Ser. No. 658,803

Int. Cl.[5] H01K *3/10*

U.S. Cl. 29—852 **1 Claim**



1. A method for making a flexible membrane tester for a planar electrical circuit including the steps of:

preparing a frame to hold said membrane;

affixing a relatively thin flexible membrane to said frame;

forming a plurality of depressions, extending the majority of the way through the membrane, form a given side thereof; and

depositing a plurality of combination electrode and leads on said given side of said membrane such that each combination includes an electrode portion at the bottom of each depression and a lead line portion extending from said given side to said electrode portion and further extending to another region on said membrane.

5,062,205

METHOD OF MANUFACTURE AND REPAIR OF TURBINE BLADES

Michael J. Fraser, Broughton Hackett, England, assignor to Refurbished Turbine Components Limited, England

Filed Jan. 22, 1990, Ser. No. 467,864

Claims priority, application United Kingdom, Jan. 24, 1989, 8901482

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] B23P *15/04*

U.S. Cl. 29—889.7 **16 Claims**

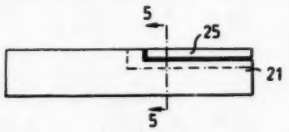
1. A method of manufacturing a turbine blade comprising the steps of:

(a) forming the turbine blade with a leading edge and a trailing edge from a first material, the turbine blade having a radially inner end and a radially outer end;

(b) forming a metallic insert for attachment to said turbine blade, said insert being formed from a material having a higher carbon content than the material from which the turbine blade is made;

(c) welding said insert to said turbine blade; and

(d) applying heat to a part of said insert, after welding said insert to said turbine blade, so as to cause hardening of said insert at least where said insert forms a part of said leading edge of the turbine blade, said heat being applied in a manner such that the hardening does not fully extend as



far as the junction between the insert and said blade so that there exists adjacent the boundary with the remainder of the blade a portion of said insert of substantially unhardened material.

5,062,206

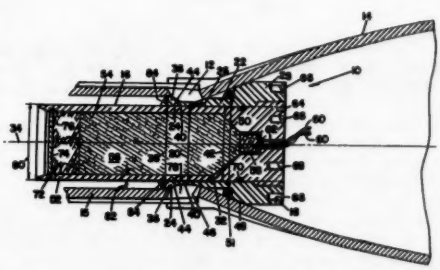
REMOVABLE ROCKET MOTOR IGNITER

Robert I. Myers, New Hope; Bryce D. Brubaker, and Robert E. Overall, both of Huntsville, all of Ala., assignors to Thiokol Corporation, Ogden, Utah

Division of Ser. No. 113,783, Oct. 26, 1987, Pat. No. 5,007,236. This application Aug. 4, 1989, Ser. No. 389,457

Int. Cl.[5] F02K *9/00*

U.S. Cl. 29—890.01 **6 Claims**



1. The method for removably installing an igniter in a rocket motor nozzle throat, the method comprising:

a. providing a sleeve having a body portion and a plurality of flexible tab members extending axially from one end of the body portion and which are spaced apart circumferentially thereof, the tab members having first portions which in combination define a diameter which is greater than the nozzle throat diameter, and the body portion having a diameter greater than the nozzle throat diameter;

b. flexing the tab members, thereby effecting movement of the first tab member portions radially inwardly so that they may be inserted through the nozzle throat;

c. inserting the first tab member portions through the nozzle throat;

d. effecting movement of the first tab member portions to substantially their unflexed positions, thereby removably locking the sleeve in position in the nozzle throat; and

e. inserting an igniter tube containing ignition material and an initiator therefor in the sleeve and removably attaching the igniter tube to the sleeve.

5,062,207

METHOD OF MAKING LIVE GAS MAIN INSERTIONS

Luther W. Martin, 1221 Julie Dr., Champaign, Ill. 61821, and Richard L. Smith, R.R. 2 - Box 82A, Edwardsville, Ill. 62025

Filed Oct. 20, 1989, Ser. No. 424,609

Int. Cl.[5] F16L *55/18*

U.S. Cl. 29—890.14 **5 Claims**

1. A method of inserting a length of smaller cross-section gas main into a first length of larger cross-section gas main while

the first length of main remains pressurized, the method consisting essentially of the steps of providing a parallel gas pathway from a second length of main upstream toward the gas supply from the first length of main into which the smaller cross-section main is to be inserted, placing a first temporary seal in the first length of main between the point at which the parallel pathway enters the first length of main and the upstream end of the first length of main, separating the first length of main from the second length of main to leave exposed an upstream end of the first length of main, placing on the exposed end of the first length of main one of an entry end fitting and an exit end fitting, each of the entry end fitting and exit end fitting having an inner end for joining to an exposed end of the first length of main, an outer end, and a passageway having the same cross-section as the length of the smaller

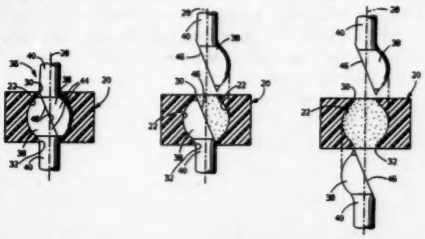
cross-section main, placing a second temporary seal upstream from the downstream end of the first length of main, preparing the downstream end of the first length of main to receive the other of the entry end fitting and the exit end fitting, mounting said other fitting on the downstream end of the first length of main, removing the second temporary seal, closing the end of the length of smaller cross-section main which is to be inserted first into the first length of main, inserting the closed end of the length of smaller cross-section main into the outer end of the entry end fitting, pushing the length of smaller cross-section main through the first length of main and through the outer end of the exit end fitting, placing permanent seals at the upstream and downstream ends of the first length of main between the inner sidewall of the first length of main and the outer sidewall of the length of smaller cross-section main, and removing the entry and exit end fittings.

5,062,208

METHOD OF MOLDING A BEARING SEPARATOR

William R. Goforth, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1990, Ser. No. 575,696
Int. Cl.[5] B21D *53/12*
U.S. Cl. 29—898.049 **2 Claims**



1. A method of injection molding a one piece, rigid plastic bearing separator having a plurality of complete pockets, each of which is designed to wrap a rolling element with a cross section of predetermined width, said pockets each having a central plane with an interior width that is substantially equal to said predetermined width, said pockets each also having a pair of openings opposed along an axis perpendicular to said central plane, said method comprising the steps of,

providing a shaping insert with an outer surface that substantially conforms to each of said pockets,

dividing each of said shaping inserts into two segments along a plane that is tilted out of said central plane, so that a projection of each insert segment along said axis and into said central plane will have an effective width less than said pocket interior width,

adjoining said insert segments along said dividing plane,

injection molding a suitable material around the outer surface of said adjoined insert segments so as to create said pockets, and,

withdrawing each said insert segment along said axis through a respective opposed opening,

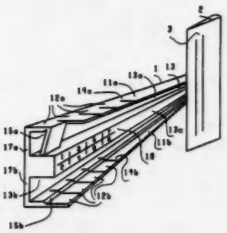
whereby each respective pocket opening is stressed by the withdrawal of said insert segment less than it would be by withdrawing an undivided shaping insert.

5,062,209

USE INDICATOR FOR A DISPOSABLE RAZOR

Elliot Rais, 60 Sutton Place South, New York, N.Y. 10022

Filed Jul. 27, 1990, Ser. No. 558,718
Int. Cl.[5] B26B *1908*; G09F *9/00*
U.S. Cl. 30—41.7 **9 Claims**



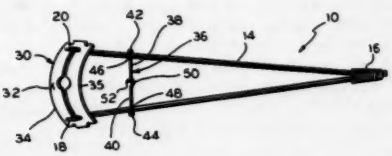
1. A disposable razor comprising a blade holder, a blade in the blade holder, a handle connected to the blade holder and means for indicating the number of times the blade has been used comprising tabs integrally formed on the handle and bendable about a pivot line from a first position indicating non-use to a second position indicating one use and indicia associated with each tab.

5,062,210

CACTUS THORN REMOVING TOOL

Jose C. Arroyo, Jr., 229 Casalon Dr. #7, O'Fallon, Mo. 63366

Filed Oct. 26, 1990, Ser. No. 605,103
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—317 **3 Claims**



1. A cutter for removing thorns from a cactus comprising:

a pair of diverging prongs pivotably connected together at one end, an opposite end of each prong including tab means sized to be received in transverse slots in a wafer type razor blade having a cutting edge; and

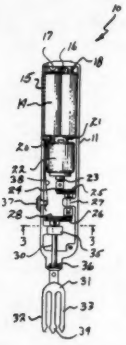
means connected between said prongs for drawing said prongs together to flex and retain said razor blade in a concavo-convex shape with a convex surface of said razor blade facing outwardly from said prongs and said cutting edge of said razor blade directed perpendicular to a plane of said prongs.

5,062,211

MOTORIZED TWISTING PASTA FORK

Paul A. Di Amico, 500 E. Palm Canyon, Palm Springs, Calif. 92264

Filed Mar. 4, 1991, Ser. No. 664,122
Int. Cl.[5] A47J *43/28*
U.S. Cl. 30—322 **1 Claim**



1. An eating utensil for gathering food such as pasta, comprising:

a handle having a hollow sleeve composed of a pair of portions snap-locked together to define internal compartments;

a fork element having an elongated shaft insertably disposed within said sleeve in rotatable relationship therewith about the central longitudinal axis of said elongated sleeve;

motor means disposed within one of said internal compartments of said sleeve and operably coupled to said elongated shaft for providing turning power to drive said fork element in a rotary movement about said central longitudinal axis;

a plurality of elongated tines carried on said fork element in fixed spaced-apart relationship for collection of pasta thereon;

said motor means includes a motor having a drive shaft;

a gear reduction mechanism interconnecting said drive shaft with said fork element shaft;

a battery pack removably carried in another one of said internal compartments in electrical contact with said motor;

switch means carried on said sleeve for selectively supplying power from said battery pack to said motor;

said plurality of elongated tines includes a central tine separating adjacent tines in fixed spaced-apart relationship;

said central tine having one end integral with said shaft and its other end terminating in a tip; and

said one end and said other end of said central tine lying on the central longitudinal axis of said sleeve and said central tine having a mid-portion between its opposite ends laterally offset from said central longitudinal axis.

5,062,212

SUNDIAL APPARATUS

James L. Blaker, 1150 Archer La., Lansdale, Pa. 19446

Filed Dec. 5, 1990, Ser. No. 622,630
Int. Cl.[5] G01C *12/34*
U.S. Cl. 33—270 **2 Claims**

1. A sundial apparatus comprising,

a support base, the support base including a mounting plate fixedly secured thereon, and

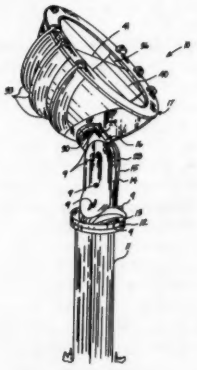
a lower rotation plate pivotally mounted to the mounting plate, and

a plurality of vertical support plates adjustably mounted to the lower rotation plate, and

an upper rotation plate pivotally mounted to the support plates, and

a sundial head member pivotally mounted to an upper surface of the upper rotation plate, and

wherein the mounting plate includes a plurality of mounting apertures for securement of the mounting plate to the support base, and the mounting plate further including a plurality of diametrically opposed first and second arcuate slots, the arcuate slots oriented parallel to an axis defined by the mounting plate, and the lower rotation plate including at least one fastener directing bore associated with each slot of the first and second arcuate slots to position a fastener through each bore and through each slot of the first and second arcuate slots, and



wherein the lower rotation plate further includes a convex surface diametrically disposed and integrally secured to an upper surface of the lower rotation plate, with the convex surface directed upwardly thereof, and each support plate of the first and second support plates are of an "L" shaped configuration, and each of the support plates including a vertical support plate mounting slot directed through a horizontal leg of each support plate, and a further fastener directed through each of the vertical support plate mounting slots within an associated lower rotation plate mounting bore, with each lower rotation mounting bore directed into the convex surface, and each of the first and second "L" shaped support plates secured together in a back-to-back relationship to define a vertically disposed support plate pair slot, wherein the support pair slot pivotally receives the upper rotation plate therewithin.

5,062,213

CONSTRUCTION SQUARE

Eugene H. Kolesky, 17231 Community Street, Lansing, Ill. 60438

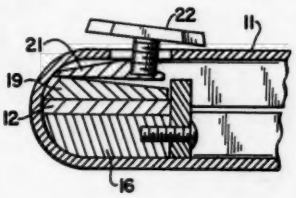
Filed Oct. 22, 1990, Ser. No. 600,837
Int. Cl.[5] B43L *7/00*
U.S. Cl. 33—479 **13 Claims**

1. An improved construction square for releasably securing a blade, comprising;

a handle;

a locking mechanism for tightening said blade within said handle, said locking mechanism being housed within said handle and including a trapezoidal-shaped filler wedge seated on the horizontal portion of an L-shaped blade

guide, and a generally rectangular member positioned above and adjacent to said filler wedge, the top face of



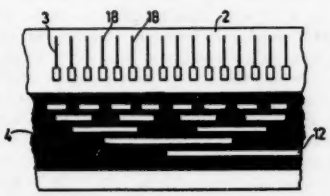
said generally rectangular member including two sloping sides and an aperture.

5,062,214

ABSOLUTE MEASUREMENT SCALE SYSTEM

Carl-Erik Gustafsson, Eskilstuna, and Bo Pettersson, Torshälla, both of Sweden, assignors to C. E. Johansson AB, Eskilstuna, Sweden

PCT No. PCT/EP87/00458, § 371 Date May 17, 1988, § 102(e) Date May 17, 1988, PCT Pub. No. WO88/02848, PCT Pub. Date Apr. 21, 1988
Continuation of Ser. No. 197,409, May 17, 1988, abandoned. This PCT application Oct. 9, 1987, Ser. No. 512,083
Claims priority, application Sweden, Oct. 13, 1986, 8604337
Int. Cl.[5] G01B *11/02*
U.S. Cl. 33—706 16 Claims



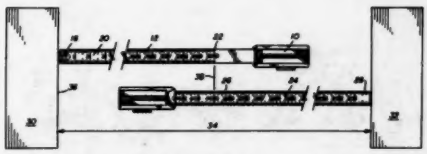
1. An absolute measuring scale system including a scale which extends a measuring length, and a measuring head which is movable relative to the scale, and which further includes a fine-measurement sensor which is operative in measuring the absolute values within each of a number of intervals located sequentially along the scale, and a coarse-measurement sensor operative in measuring the absolute values with regard to the interval in which the fine-measurement sensor is located at that moment, where the scale (2) includes a carrier (38) made of a transparent and form-stable material, which has provided on its surface a coating which forms an opaque pattern (3, 4; 3', 4'); which pattern forms along the length of the scale (2) transparent, mutually parallel binary code tracks (12) for use by said coarse measurement sensor and where the measuring head (1) incorporates light-emitting (5) and light-sensitive (6) devices by means of which the measuring head (1) is intended to sense the code track (12), the coarse-measurement sensor including the code-tracks (12) and said light emitting (5) and light sensitive (6) devices; and where said pattern (3, 4; 3', 4') along the length of the scale (2) also forms a plurality of sensing members which are intended to co-act with the fine-measurement sensor, said fine measurement sensing members including electrodes (18) which are formed by means of said surface coating and which, in coaction with electrodes (23–27, 28) provided in the measuring head (1), are included in a capacitive measuring system forming said fine measurement sensor.

5,062,215

CONTINUOUS TAPE MEASURE

George J. Schlitt, Raleigh, N.C., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 383,308, Jul. 18, 1989, abandoned, which is a continuation of Ser. No. 219,662, Jul. 14, 1988, abandoned. This application Feb. 21, 1991, Ser. No. 657,983
Int. Cl.[5] G01B *3/10*
U.S. Cl. 33—755 2 Claims



1. A measuring tape for measuring a linear distance comprising:

a tape having a first side and a second side;

a case for housing said tape;

said tape having one end secured within said case whereby the other free end may be extended from said case a maximum length;

said first side having first graduations beginning at zero at said free end and sequentially scaled to a measurement N substantially equal to said maximum length of said tape;

said first and second sides including numbers for said first and second graduations, said numbers having a top with the top of said numbers on said first and second sides being adjacent a common edge of said tape;

said second side having second graduations beginning at said free end and starting with said measurement N and sequentially scaled to a measurement 2N substantially equal to twice said maximum length of said tape whereby said first and second graduations increase in a common direction on said tape and measure a linear distance substantially twice said maximum length of said tape such that said free end may be aligned with one end of the linear distance, said tape extended to said measurement N, and said measurement N being marked, and said tape being reversed with said free end aligned with the other end of the linear distance and the measurement on said second side of said tape at the mark indicating the total measurement of the linear distance; said first and second sides including numbers for said first and second graduations, said numbers having a top with the top of said numbers on said first and second sides being adjacent a common edge of said tape.

5,062,216

SINGLE TIERED MULTI-CYLINDER PAPER DRYER APPARATUS

Judson Hannigan, Scarsdale, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 85,163, Aug. 14, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 253,440
Int. Cl.[5] F26B *5/04*
U.S. Cl. 34—16 3 Claims

1. A process for drying a paper web, said process comprising the steps of:

arranging first and second pluralities of consecutive cylindrical dryers in a single tier in tandem;

entraining a first run of the web on said first plurality of cylindrical dryers such that one face of said web is exposed to said first plurality of cylindrical dryers;

entraining a second run of the web on said second plurality of cylindrical dryers such that the opposite face of said web is exposed to said second plurality of cylindrical dryers;

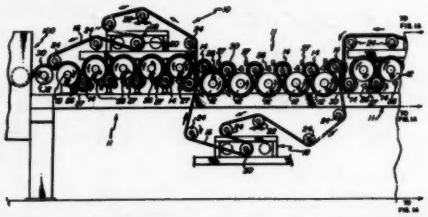
rotating sad first plurality of cylindrical dryers in one direc-

tion and said second plurality of cylindrical dryers in the opposite direction;

overlaying said first run of said web with a a second endless belt which moves in concert therewith;

overlaying said second run of said web with a second endless belt which moves in concert therewith;

moving a run of said first endless belt and a run of said second endless belt adjacent to each other at an interface between said first and second pluralities of cylindrical dryers, the interface comprising a first section where said



endless belts define parallel planes and a second section where one of said belts defines a second plane substantially tangent to the other belt, the second plane being aligned to intersect the parallel planes; and

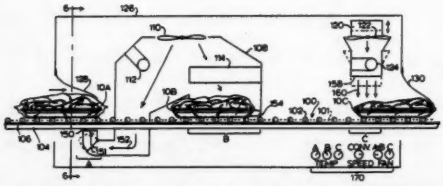
sandwiching said web between said run of said first endless belt and said run of said second endless belt at said interface to transfer said web from said first plurality to said second plurality of cylindrical dryers, whereby said web is fully supported between said first and second endless belts throughout the interface between the first and second pluralities of cylindrical dryers.

5,062,217

SELECTIVE SEQUENTIAL SHRINK APPARATUS AND PROCESS

Sidney S. Tolson, Scotland Neck, N.C., assignor to Ossid Corporation, Rocky Mount, N.C.

Filed Nov. 13, 1990, Ser. No. 611,530
Int. Cl.[5] F26B *3/00*
U.S. Cl. 34—22 **25 Claims**



15. A process for the shrinking of a heat shrinkable film forming a package enclosing a product supported in a shallow rectangular tray with a peripheral upper flange, said film being sealed across leading and trailing ends of said tray, comprising:

(a) transporting said film wrapped package on a conveyor through a shrink tunnel having three operative sequential stations capable of applying directed streams of heated air to packages passing thereby;

(b) blowing a heated air stream at a first station from beneath and through said conveyor upwardly at a bottom surface of said package and particularly at the leading and trailing end seals thereof such that said end seals are drawn beneath said tray flange;

(c) blowing a pair of horizontally opposed heated air streams at a second station from beside said conveyor laterally at both lower sides of said package such that said side film is tightened in the lower portion; and

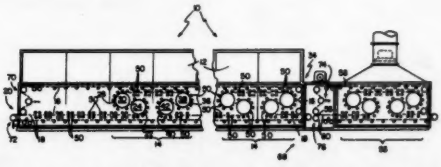
(d) blowing a heated air stream at a third station from above said conveyor downwardly at a top surface of said package such that the entire film enclosure is tightened and essentially free of wrinkles with said end seals drawn beneath said peripheral flange.

5,062,218

SCREEN DRYER

George Weil, Mississauga, Canada, assignor to David R. Webb Co., Inc., Edinburg, Ind.

Filed Oct. 9, 1990, Ser. No. 593,941
Int. Cl.[5] F26B *11/02, 13/00*
U.S. Cl. 34—114 **13 Claims**



1. A veneer dryer having an entry end and an exit end conveyor means for conveying sheets of veneer through the dryer from the entry end to the exit end, and means for applying a drying medium to the veneer in the dryer, the conveyor means including a first set of drums, each having an axis of rotation and being rotatably mounted in the dryer, a pair of belts permeable by the medium, the belts running together over the drums, the sheets being captured for conveyance through the flow of drying medium in the dryer between the belts, the belts extending around a first set of said drums generally from the entry end toward the exit end, then generally from the exit end toward the entry end, then generally from the entry end toward the exit end, then generally from the exit end toward the entry end, and then generally from the entry end toward the exit end, and further comprising a second set of said drums, the belts extending around said second set of drums first generally from the entry end toward the exit end, then generally from the exit end toward the entry end, then generally from the entry end toward the exit end, then generally from the exit end toward the entry end, and then generally from the entry end toward the exit end the axes of rotation of the first and second sets of drums and the surfaces of the first and second sets of drums being so spaced that the sheets of veneer are pressed against the surfaces of the first and second sets of drums for greater than 180° of the rotation of each of the first and second sets of drums.

5,062,219

AIR FLOW APPARATUS FOR CLOTHES DRYER

Robert D. Harris, Oshkosh, and Brett J. Putnam, Ripon, both of Wis., assignors to Speed Queen Company, Ripon, Wis.

Filed Feb. 12, 1991, Ser. No. 654,442
Int. Cl.[5] F26B *11/02*
U.S. Cl. 34—133 **24 Claims**

1. A clothes dryer comprising:

a clothes drum having an air inlet and a perforated annulus;

a cabinet surrounding said drum and defining a region of space between said drum and said cabinet;

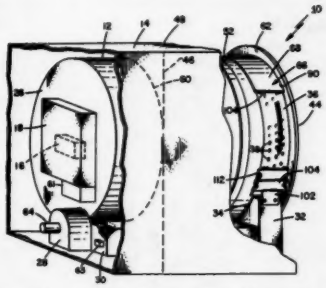
means for axially rotating said drum;

means communicating with said inlet for providing hot air;

stationary means surrounding an arcuate portion of said perforated annulus for drawing said hot air into said drum through said inlet and out perforations of said annulus instantaneously aligned with said stationary drawing means; and

means for preventing air flowing from said drum into said

region of space through perforations of said annulus not instantaneously aligned with said stationary drawing means, said preventing means comprising a flexible wrap supported in sliding engagement by said drum.

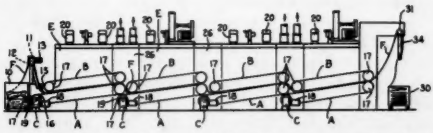


5,062,220

TEXTILE FABRIC DRYER AND METHOD

Hans O. Keilhack, P.O. Box 19042, Charlotte, N.C. 28219

Filed Jun. 27, 1990, Ser. No. 545,412
Int. Cl.[5] F26B *13/04*
U.S. Cl. 34—155 18 Claims



1. A textile fabric drying and shrinking apparatus having an elongated oven containing means for blowing heated air through fabric conveyed through said oven comprising:

a plurality of upwardly inclined conveyors constructed of foraminous belts carrying said textile fabric thereon;

a drive for each of said conveyors moving said conveyors at a predetermined speed with respect to a preceding conveyor so as to convey said fabric along said oven; and

a blower directing heated air through said conveyors and the fabric carried thereon;

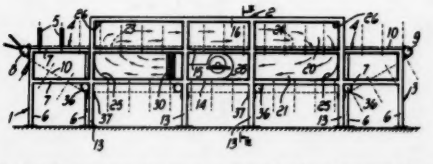
whereby control of drying and shrinking may be facilitated.

5,062,221

DRYING SYSTEM FOR PASTA OR SIMILAR PRODUCTS

Patrizio Fazion, Casaleone, Italy, assignor to Eurovo S.r.l., Santa Maria in Fabriago-Lugo, Italy

Filed Jan. 26, 1990, Ser. No. 471,302
Claims priority, application Italy, Feb. 2, 1989, 84909 A/89
Int. Cl.[5] F26B *19/00*
U.S. Cl. 34—204 8 Claims



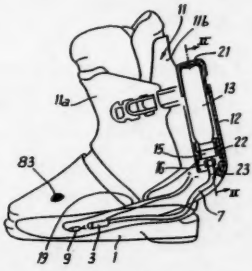
1. A drying system for pasta, comprising in sequence at least one loading station, at least one drying station with forced warm-air circulation defining a drying air flow, an unloading station and at least one conveyor for transferring pasta from the loading station to the unloading station through the drying station, said conveyor comprising a plurality of pasta engagement and support means arranged in sequence along said conveyor for placing pasta in an arrangement which is predominantly transverse with respect to the flow of drying air, said engagement and support means of the conveyor comprising a plurality of box-like receptacles with perforated walls for receiving each at least one portion of thin pasta layer at the loading station and keeping said portion in a planar arrangement during passage through the drying station up to the unloading station.

5,062,222

SHOE OR BOOT HAVING A HEATING DEVICE

Philippe Billet, Annecy-le-Vieux, and Jean-Louis Demarchi, Duingt, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Sep. 19, 1989, Ser. No. 409,457
Claims priority, application France, Sep. 19, 1988, 88 12197
Int. Cl.[5] A43B *7/02*
U.S. Cl. 36—2.6 48 Claims



1. A ski shoe or boot having a foot support zone, a sole, and an upper, said upper including a rear part, said shoe or boot further including a heating assembly, at least a portion of said heating assembly being located proximate said sole, said heating assembly comprising a catalytic burner for producing heat, an electrode positioned proximate said catalytic burner, an igniter functionally connected to said electrode, and a pusher for activating said igniter, a plate for diffusion of said heat, said plate located proximate said foot support zone, means for receiving a source of fuel, a supply circuit for feeding said fuel to said catalytic burner, a valve for regulating said feeding of said fuel from said source of fuel to said catalytic burner, and a heating control device, wherein said means for receiving a source of fuel comprises means for receiving and holding an interchangeable fuel cartridge, comprising a housing provided on said rear part of said upper of said shoe or boot in position for connecting said interchangeable fuel cartridge to said supply circuit, said igniter being positioned proximate said housing, said housing further comprising an upper end, said boot further including a cover movably mounted with respect to said upper end of said housing and being adapted to engage an upper portion of said fuel cartridge and said pusher.

5,062,223

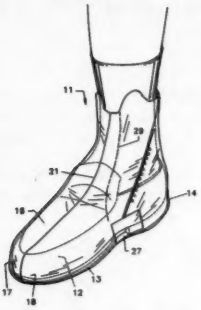
ADJUSTABLE SHOE COVERING

Gregory K. Johnson, Palo Alto, Calif., assignor to Innova Products, Inc., Santa Clara, Calif.

Continuation of Ser. No. 293,944, Jan. 5, 1989, abandoned. This application Jul. 6, 1990, Ser. No. 549,252
Int. Cl.[5] A43B *17/14*
U.S. Cl. 36—7.1 R 5 Claims

1. A disposable shoe covering to be applied over a shoe comprising a boot portion of a flexible material for covering the vamp, sole and heel of said shoe, and means for both adjusting the fit of said boot portion over said shoe, sole and heel to obtain a snug fit and securing said portion on said shoe; said means for both adjusting the fit of said boot portion over said shoe sole and securing said portion on said shoe also securing

to the boot portion covering said wearer's shoe, that excess material making up said boot portion which is not needed for said boot portion to snugly fit about said wearer's shoe, said means being adapted to secure said excess material to said boot



portion after said excess material is wrapped around said boot portion toward either of the two sides of said wearer's shoe; and wherein said means for securing is a pressure sensitive adhesive provided on both side surfaces of the same rear end section of said boot portion.

5,062,224

SKI BOOT WITH VARIABLE-INCLINATION UPPER SPOILER

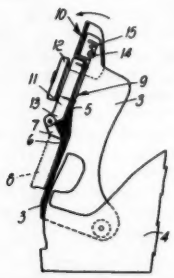
Maurizio Tacchetto, Noventa Padovana, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Nov. 13, 1990, Ser. No. 611,592

Claims priority, application Italy, Dec. 21, 1989, 82627 A/89

Int. Cl.[5] A43B 5/04

U.S. Cl. 36—117 **5 Claims**



1. Ski boot with a variable-inclination upper spoiler, said ski boot comprising a shell, and a front quarter and a rear quarter both articulated to said shell, said rear quarter comprising a lower part and said upper spoiler, said lower part of said rear quarter being pivotally articulated to said shell, said upper spoiler being pivoted exclusively to said lower part at a transverse axis defined on said lower part, said ski boot further comprising a first adjustment device and a second adjustment device, said first adjustment device and said second adjustment device both being connected to said rear quarter, wherein said first adjustment device is arranged at said lower part of said rear quarter and said second adjustment device is arranged at said upper spoiler.

5,062,225

SKI BOOT CLOSURE DEVICE HAVING A LEVER WITH A SLIDING TENSIONING ARRANGEMENT

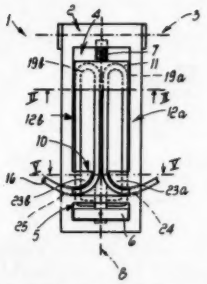
Roberto Gorza, Feltre, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jun. 25, 1990, Ser. No. 542,547

Claims priority, application Italy, Jul. 4, 1989, 59375/89[U]

Int. Cl.[5] A43B 5/04

U.S. Cl. 36—117 **12 Claims**



1. Closure device, particularly for ski boots, comprising a lever which is articulated, at one end, to a ski boot, and at least one slider which is provided with means which can be actuated by the skier for its axial movement with respect to said lever, said device further comprising at least one traction element which is guided both on said lever and, in separate points, to said at least one slider, said traction element exiting at the sides of said lever at fixed openings, said at least one traction element having at least two entry points and two exit points on said at least one slider, a first axial seat and a second axial seat being provided at said lever, said seats being separated by a dividing wall, said first and second axial seats being connected by means of a first hole arranged according to an axis which is parallel to the longitudinal axis of said lever, wherein second and third through holes are provided at said dividing wall adjacent to the longitudinal perimetric edges of said first and second axial seats, said holes being arranged parallel to the longitudinal axis of said lever on a plane which is adjacent to the lower surface of said lever.

5,062,226

HEEL SECURING DEVICE, PARTICULARLY FOR SKI BOOTS

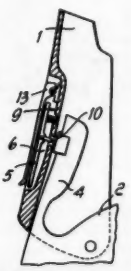
Mariano Sartor, Montebelluna, and Roberto Gorza, Feltre, both of Italy, assignors to Nordica S. p. A., Montebelluna, Italy

Filed Dec. 14, 1989, Ser. No. 450,500

Claims priority, application Italy, Dec. 23, 1988, 82620A/88

Int. Cl.[5] A43B 5/04

U.S. Cl. 36—117 **12 Claims**



1. Heel securing device, particularly for ski boots comprising a shell, a rear quarter and a front quarter articulated to said shell, and a flap means arranged at the heel region of the ski

boot for embracing the heel of the foot, said device comprising an abutment member for abutting against the flap means of the ski boot, said abutment member comprising a stem means protruding through a seat means provided in said rear quarter at the heel region thereof, the ski boot further comprising quarters fastener means for the mutual fastening together of the rear and front quarters about the wearer's leg, said quarters fastener means being connected to said rear quarter, wherein said quarters fastener means engage with said stem means upon a quarters closing activation of said quarters fastening means to move said stem means in said seat means relative to said rear quarter, thereby said abutment member provides an abutting securement adjustment of said flap means about the heel.

5,062,227

DEVICE FOR BREAKING OBJECTS CONSISTING OF CONCRETE OR SIMILAR MATERIAL

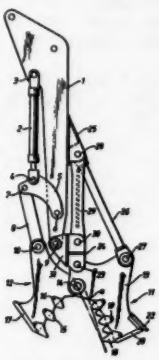
Gertrudis M. G. De Gier, JZ Velddriel, and Jan R. Sytstra, Am Papendrecht, both of Netherlands, assignors to Verachtert Beheer B.V., 's-Hertogenbosch, Netherlands

Filed Jun. 15, 1990, Ser. No. 538,726

Claims priority, application Netherlands, Jun. 20, 1989, 8901542

Int. Cl.[5] E02F *3/76*; B66C *3/00*

U.S. Cl. 37—117.5 11 Claims



1. A device for breaking objects, which comprises:

an excavator arm;

a pair of jaws having teeth, said jaws including a first fixed jaw and a second pivotable jaw;

a pivot pin for pivotably interconnecting said jaws;

a first hinge pin for mounting said jaws of said arm;

a first strut connecting said first fixed jaw to the arm

a setting cylinder having a first end coupled to the arm and having a second end coupled to the second jaw such that the second jaw is pivotable toward and away from the first fixed jaw by means of said setting cylinder;

a coupling piece coupled to an end of the arm by means of the first hinge pin wherein the first fixed jaw is connected to the coupling piece at a point which is located between the first hinge pin and a point of attachment of the first strut to the first jaw; and a second strut interconnecting the coupling piece and an end of the first strut.

5,062,228

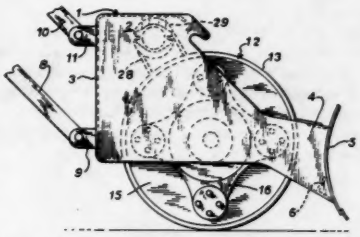
COMPACTOR AND BLADE ATTACHMENT FOR LOADER

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to M-B-W Inc., Slinger, Wis.

Filed Jul. 2, 1990, Ser. No. 546,899

Int. Cl.[5] E02F *3/76*

U.S. Cl. 37—117.5 4 Claims



1. An attachment for a front-end loader having lift arm means and tilt arm means, said attachment comprising a frame including a pair of side plates, first connecting means for pivotally connecting the lift arm means of the loader to said frame about a first pivot axis, second connecting means for pivotally connecting the tilt arm means of the loader to said frame at a second pivot axis spaced from said first pivot axis, a compaction drum mounted for free rotation about a horizontal drum axis with respect to said frame and disposed to move over the terrain in a fore and aft direction normal to the drum axis, a scraping blade fixed to said frame said first and second connecting means being disposed on one side of a vertical plane extending along said drum axis and said scraper blade being disposed on a side opposite said one side of said vertical plane, said tilt arm means being constructed and arranged to tilt said frame about said first pivot axis to thereby move the lower edge of said blade from an inoperative position where said lower edge is above the level of the lower extremity of said drum to an operative position where said lower edge is disposed beneath the level of said lower extremity of said drum, vibratory means operably connected to said drum, drive means mounted on the drum and operably connected to said vibratory means for operating said vibratory means to vibrate said drum, an end plate disposed between each end of the drum and the corresponding side plates, journalling means for journaling each end plate for rotation relative to the corresponding side plate, and resilient isolation mount means interconnecting each end plate and the corresponding end of said drum.

5,062,229

POSTCARD CALENDAR

Christina Werjefelt, 277 Kaha St., Kailua, Hi. 96734

Filed Jan. 12, 1990, Ser. No. 464,398

Int. Cl.[5] B42D *5/04, 15/00*

U.S. Cl. 40—107 1 Claim

1. A calendar, comprising:

a) a plurality of sheets superimposed on each other, each of said sheets having front and rear faces and a top edge;

b) means for hingeably binding said plurality of sheets along said top edges such that each of said sheets may be rotated in planar position about said binding means through substantially a full circle to thereby expose said front face of a next succeeding sheet and said rear face of the sheet being turned when said calendar is rotated about an imaginary vertical axis;

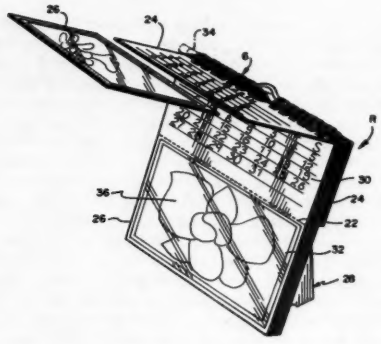
c) each of said sheets including a straight demarcation line disposed across thereof from one side to the opposite side;

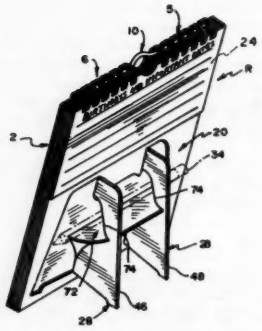
d) each of said sheets including a first portion adjacent said binding means and a second portion disposed away from said binding means and separated by said demarcation line;

e) said second portion being detachable from said first portion through said demarcation line such that when said second portion is detached from said first portion, said first portion remains attached to said binding means and a second portion of a succeeding sheet is exposed;

f) said first portion including a front surface having right-side-up calendar indicia relative to said top edge for a complete unit of time and a rear surface having non-calendar indicia and blank ruled spaces for receiving written notes;

g) said second portion including a front surface having printed graphic art indicia and a rear surface having a blank postcard indicia, said graphic art indicia being right-side-up when said calendar indicia is oriented right-side-up, said second portion rear surface including a blank space for receiving an address and another blank space for receiving a written message;





h) each of said top edges including a notch disposed on an intermediate portion thereof;

i) a member pivotally secured to said binding means for permitting the calendar to be hung from a wall;

j) said member including a curved portion disposed opposite said notch;

k) a back cover secured to said plurality of sheets, said back cover being of the same size as each of said sheets;

l) a fold-out stand integral with said back cover for providing support to the calendar when positioned substantially vertically on a horizontal surface; and

m) said stand being completely disposed below said demarcation line such that said upper portion, when rotated substantially a full circle about said binding means after its respective lower portion has been detached, does not interfere with said stand.

5,062,230

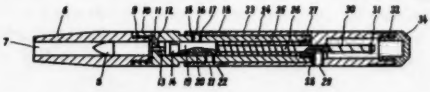
PEN GUN

Robert J. Braverman, Marblehead, and Isaak M. Shklyarov, Boston, both of Mass., assignors to R. J. Braverman Corp., Winthrop, Mass.

Filed Nov. 5, 1990, Ser. No. 608,707

Int. Cl.[5] F41C *9/02*

U.S. Cl. 42—1.09 **2 Claims**



1. A single shot pistol which simulates the appearance of a modern pen like instrument, comprised of a barrel adapted to receive a cartridge and threadably connected to a main body having coaxial front and rear bores spaced apart by a breech block with an aperture through which a firing pin assembly which is mounted for reciprocative movement in said rear bore can project a firing pin through said aperture and engage and fire said cartridge after the firing pin assembly has been retracted and locked into a ready to fire position by simultaneously pulling a trigger collar forward and a rear housing rearward which causes the firing pin assembly to be locked behind a ball bearing which is forced down into a groove in the firing pin assembly until it is released by sliding the trigger collar rearward causing the ball bearing to be forced upwards into a recessed cavity on the interior surface of the trigger collar causing a compressed firing pin spring to force the firing pin assembly forward with sufficient force to fire said cartridge.

5,062,231

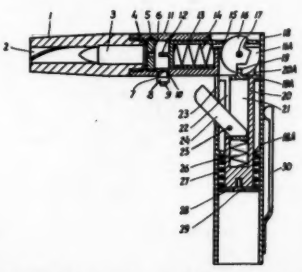
DUEL PROFILE PEN GUN

Robert J. Braverman, Marblehead, and Isaak M. Shklyarov, Boston, both of Mass., assignors to R. J. Braverman Corp., Winthrop, Mass.

Filed Feb. 8, 1991, Ser. No. 653,496

Int. Cl.[5] F41C *9/02*

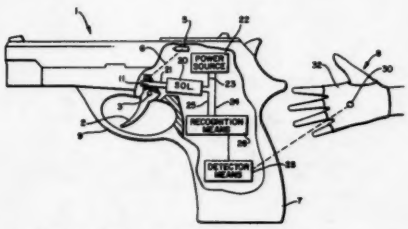
U.S. Cl. 42—1.09 **2 Claims**



1. A single shot pistol which simulates the appearance of a modern pen like instrument, comprised of a barrel adapted to receive a cartridge and threadably connected to a main body having coaxial front and rear bores spaced apart by a breech block with an aperture through which a firing pin assembly which is mounted for reciprocative movement in said rear bore can project a firing pin through said aperture and engage and fire said cartridge after the firing pin assembly has been retracted and locked into a ready to fire position by simultaneously pulling the barrel forward and the rear housing rearward which exposes a hinge joint that will allow a rear handle to be bent downward, exposing a hidden trigger and causing a firing pin carrier to be drawn rearward until it is released by pressing the trigger inward causing a control pin to release a cam which in-turn releases the firing pin carrier under pressure

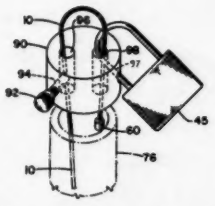
from a compressed spring to force the firing pin carrier forward with sufficient kinetic energy to fire said cartridge.

5,062,232
SAFETY DEVICE FOR FIREARMS
Larry D. Eppler, 1817 Highridge Cove, Carrollton, Tex. 75006
Filed Feb. 23, 1990, Ser. No. 483,660
Int. Cl.[5] F41A *17/06*
U.S. Cl. 42—70.11 4 Claims



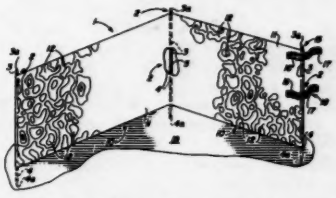
1. A safety device for a firearm comprising:
a trigger mechanism operably connected to the firearm to discharge the firearm;
a power source;
trigger interrupting means operably connected to the trigger mechanism to prevent the trigger mechanism operation from movement to render the firearm inoperable;
recognition means operably connected to the trigger interrupting means and connected to the power source;
code detecting means operably connected to the recognition means to enable the recognition means to disengage the trigger interrupting means upon receipt of a signal;
code generating means to generate a signal to enable the code detecting means; and
means for attaching the code generating means to the palm of a user's gun hand.

5,062,233
SAFETY DEVICE FOR A FIREARM
Franklin C. Brown, 1967 Genoa Ave., Akron, Ohio 44305
Continuation-in-part of Ser. No. 391,883, Aug. 8, 1989. This application Jan. 14, 1991, Ser. No. 641,452
Int. Cl.[5] F41A *17/44*
U.S. Cl. 42—70.11 10 Claims



1. A safety device for a firearm having a barrel with a first end and a second end which comprises:
(a) a cable having a first end and a second end;
(b) a plug element firmly affixed to the first end of the cable;
(c) a stopper firmly affixed to the second end of the cable;
(d) a restricting means comprising a plug like element having a diameter greater than a diameter of said firearm barrel, said restricting means comprising at least one cable bore formed therein, said bore having two open ends and a diameter slightly larger than a diameter of said stopper such that said bore is capable of receiving said cable therethrough and a means for securing said restricting means to said cable; and
(e) a locking device inserted through at least a portion of said cable bore in said restricting means for retaining said restricting means on said cable.

5,062,234
PORTABLE BLIND
Richard T. Green, 1023 N. 15th St., Arkadelphia, Ark. 71923
Filed Jul. 24, 1989, Ser. No. 383,726
Int. Cl.[5] A01M *31/02*
U.S. Cl. 43—1 2 Claims



1. A portable blind for concealing an observer, comprising at least two elongated supports for insertion in the ground in spaced, upward-standing relationship, said supports each characterized by a bottom member having one end sharpened and a receptacle provided on the opposite end of said bottom member, a top member having one end adapted for insertion in said receptacle and the opposite end of said top member sharpened and an elastic band connecting said one end of said top member and said opposite end of said bottom member for biasing said top member in said receptacle; a flexible sheet of camouflage material carried by said supports, a first camouflage pattern provided on one side of said camouflage material and a second camouflage pattern provided on the opposite side of said camouflage material to facilitate insertion of said bottom member in the ground for orienting said camouflage material in a first camouflage orientation and orienting said first camouflage pattern outwardly of the observer and said top member in the ground for orienting said camouflage material in a second camouflage orientation and orienting said second camouflage pattern outwardly of the observer; loop and pile fasteners provided on said camouflage material; and at least one drawstring provided in one edge of said camouflage material, whereby said supports are foldable in said camouflage material and said camouflage material is secured by said loop and pile fasteners to bind said camouflage material and said supports in carrying configuration.

5,062,235
ARTIFICIAL BAIT FOR FISH AND SHELLFISH
Harold T. Cook, Jr., Bainbridge Island, and Mimi S. Fielding, Gig Harbor, both of Wash., assignors to Marco Seattle, Inc, Seattle, Wash.
Filed Jun. 22, 1990, Ser. No. 543,117
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42 17 Claims

1. A method for making an artificial bait comprising:
forming a mixture of the following proportions:

alginate	4% to 8%
fiber	1% to 4%
attractant	trace to 40%
setting agent	0.5% to 4%
water	balance

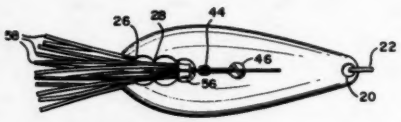
all percentages being by weight based on the total weight of the composition;
forming the resulting mixture into a shape and allowing said mixture to gel.

5,062,236

FISHING LURE

Gerald Fish, P.O. Box 1135, Cape Canaveral, Fla. 32930

Filed Feb. 5, 1990, Ser. No. 475,264
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.5 **13 Claims**



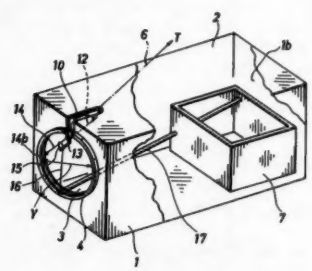
1. A fishing lure comprising:
a) a spoon portion;
b) said spoon portion having a longitudinal slot extending from an intermediate part of said spoon portion to one end thereof;
c) tooth means along the edges of said spoon portion defining the longitudinal slot;
d) a fish hook secured to said spoon portion and extending in overlying relation to the longitudinal slot thereof; and
e) a flexible tail portion positioned on said fish hook, a portion of said tail portion extending through the longitudinal slot and frictionally engaged by said tooth means to prevent relative movement between said tail portion and spoon portion.

5,062,237

NOOSING BEAR TRAP

Nobuhiro Kitagawa, 50-42, Sata, Mihama-cho, Mikata-gun, Fukui-ken, and Sigeru Gotsugi, 1-4-1, Sunagare, Tsuruga-shi, Fukui-ken, both of Japan

Continuation-in-part of Ser. No. 219,727, Jul. 7, 1988, abandoned. This application Dec. 29, 1989, Ser. No. 459,371
Claims priority, application Japan, Nov. 30, 1987, 62-182090[U]
Int. Cl.[5] A01M *23/34*
U.S. Cl. 43—86 **39 Claims**



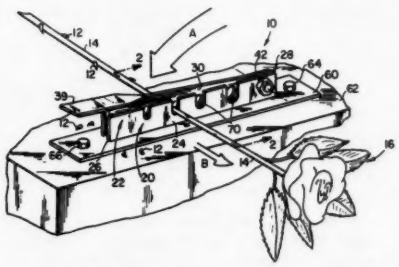
1. A noosing bear trap comprising:
a main body defining an interior space, said main body being provided with at least one access opening which allows insertion of a bear's hand into said interior space for taking a bait placed therein at a position spaced from said access opening;
a capturing wire fixable at one end and formed at the other end with a diametrically variable noosing loop located at or adjacent said access opening; and
trigger means which causes said noosing loop to be tensioned for diametrical reduction in response to the movement of the bear's hand for taking the bait; wherein
said capturing wire is normally subjected to a pre-tension; and
said trigger means includes a tension blocking device which normally blocks said pre-tension of said capturing wire before said noosing loop but allows said pre-tension to be applied to said noosing loop in response to the movement of the bear's hand for taking the bait.

5,062,238

ROSE THORN STRIPPER

Glenn Smith, and Roseanna Smith, both of R.R. #2, Box 33-3, Covington, Ind. 49732

Filed Jul. 13, 1990, Ser. No. 552,071
Int. Cl.[5] A01G *1/04*
U.S. Cl. 47—1.01 **12 Claims**



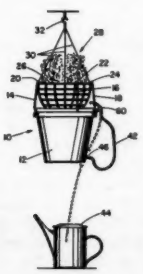
1. An apparatus for removing protuberances extending from a plant stem comprising:
a first stripping arm having a longitudinally extending first body terminating in an opposed first and second end, said first body having a first stripping arm edge extending between the first and second ends,
a second stripping arm having a longitudinally extending second body terminating in an opposed first and a second end, said second body having a second stripping arm edge extending between the first and second ends,
a pivot extending through and connecting the first end of the first body of the first stripping arm and the first end of the second body of the second stripping arm to allow pivotal movement of the second stripping arm relative to the first stripping arm, and
mounting means for mounting the first stripping arm to a base to permit stripping of protuberances from any stem received between the stripping arms without requiring the apparatus to be manually held thereby inhibiting injury from the protuberances during their removal.

5,062,239

METHOD AND APPARATUS FOR WATERING POTTED PLANTS

Arch W. Helton, 6575 W. LoopSouth STE. 650, Bellaire, Tex. 77401

Filed Feb. 26, 1990, Ser. No. 484,782
Int. Cl.[5] A01G *25/00*
U.S. Cl. 47—79 **13 Claims**



1. Apparatus for watering a hanging plant having a con-

tainer with soil therein for growing plants and a bridle for suspension thereof, comprising:

(a) a receptacle having bottom and side wall means and forming an upwardly directed opening having sufficient dimension for collection of any water dripped from said hanging plant, said side wall means having a drain opening near said bottom wall;

(b) a plurality of hanger elements disposed for suspension of said receptacle, said hanger elements being adapted for releasable engagement with said container of said hanging plant;

(c) a water drain fitting being provided in said drain opening means and forming an outlet at the lower portion of said receptacle; and

(d) a flexible liquid drain tube extending from said and being of sufficient length to extend above said receptacle and to extend a predetermined distance below said receptacle, said flexible liquid drain tube forming an open free end.

5,062,240

VEHICLE DOOR

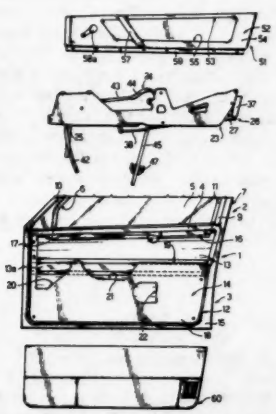
Enzo Brusasco, Turin, Italy, assignor to Roltra, Morse S.p.A., Vica-Rivoli, Italy

Filed Nov. 7, 1990, Ser. No. 609,768

Claims priority, application Italy, Nov. 9, 1989, 67984 A/89

Int. Cl.[5] E05F *11/48*; B60J *5/04*

U.S. Cl. 49—348 **7 Claims**



1. A vehicle door (1) having an upper window opening (6) fitted with a sliding window (5), and comprising, at the bottom, a box body (12) defined by an inner sheet (14) and an outer sheet (13) connected peripherally to each other; characterised by the fact that said inner sheet (14) presents an opening (16) extending over a relatively small upper portion of the same; a self-supporting frame (23) being connected in removable manner to said inner sheet (14) for closing said opening (16); a first finish panel (51) being connected to said inner sheet (14) for covering said frame (23); a second finish panel (60) being provided outside said box body (12) for covering said inner sheet (14); and door locking means (26, 27) and window regulating (24) and guide (25) means being connected to said frame (23).

5,062,241

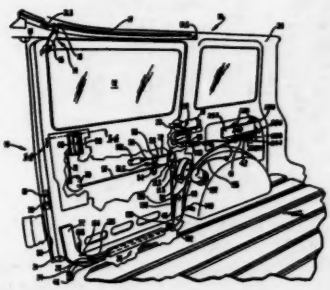
VARYING RADIUS HELICAL CABLE SPOOL FOR POWERED VEHICLE DOOR SYSTEMS

Daniel L. DeLand, Davison, Mich., assignor to Masco Industries, Inc., Taylor, Mich.

Continuation-in-part of Ser. No. 497,487, Mar. 22, 1990, and a continuation-in-part of Ser. No. 497,546, Mar. 22, 1990, and a continuation-in-part of Ser. No. 497,603, Mar. 22, 1990, and a continuation-in-part of Ser. No. 497,504, Mar. 22, 1990, Pat. No. 4,984,385. This application Aug. 1, 1990, Ser. No. 561,313

Int. Cl.[5] E05F *11/00*

U.S. Cl. 49—460 **64 Claims**



33. In a cable-actuated door operator system having a cable spool, drive means for selectively rotating said cable spool about an axis in either of two directions, and a cable with one end interconnected with a movable door in order to cause movement of the door in response to rotation of said cable spool, a first portion of the movement of the door being a high displacement/low force movement, and a second portion of the movement of the door being a low displacement/high force movement, the improvement comprising: cable attachment means for securing the opposite end of the cable to said cable spool; and a groove formed along a generally helical path on a circumferential portion of said cable spool for windingly receiving the cable therein as said cable spool is selectively rotated in one direction and for unwindingly paying out the cable therefrom as said cable spool is selectively rotated in an oposite direction, the radial depth of said helical groove varying along at least a portion of said helical path in order to cause the cable to be wound onto, and paid out from, said varying-depth portion of said helical groove at a varying rate with respect to the rotation of said cable spool in both the high displacement/low force movement and the low displacement-/high force movement of the door, thereby causing the movable door to move at a correspondingly varying rate with respect to the rotation of said cable spool when said cable is wound onto, and paid out from, said varying-depth portion of said helical groove.

5,062,242

HIGH DENSITY STORAGE FACILITY

John Corcoran, Dennis, Mass. 02638

Filed Jul. 10, 1989, Ser. No. 378,156

Int. Cl.[5] E04H *3/04*; A47B *5/00, 53/00*

U.S. Cl. 52—36 **1 Claim**

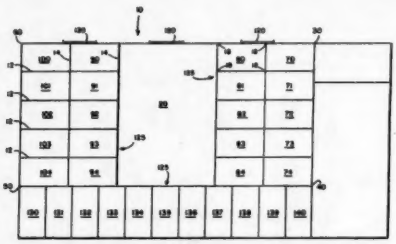
1. A high density storage facility comprising:

a building enclosing a rectangular floor area of certain length and width;

a plurality of rectangular storage racks of certain height divided from top to bottom into storage slots, the slots extending the rectangular length of the racks and being opened and accessable for inserting and removing objects into and from the width ends of the racks; the racks being disposed within the enclosed rectangular floor area and including means for rolling the racks along the floor area, the racks arranged in row within the rectangular floor area the rows of racks comprising a series of spaced verti-

cal supports interconnected by a series of spaced horizontal supports, the lengthwise sides of the racks being arranged substantially parallel to the lengthwise sides of the rectangular floor area, the rows comprising a plurality of side by side racks which collectively fit within and across the width of the floor area, said rows rollably moveable in a lengthwise direction along the floor area;

the building including a wall disposed substantially parallel to a lengthwise side of the rectangular floor area, the wall including door means selectively disposed along the



length of the wall for providing access to all of the width ends of all of the racks;

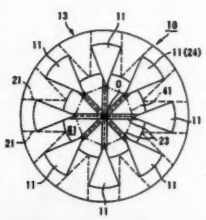
the racks being rollably moveable along the length of the enclosed rectangular floor area for providing access to the width ends of the racks from the door means, said racks disposed within the enclosed floor area sufficient to leave a portion of the floor area unoccupied which is of a size sufficient to provide access from the door means to the width ends of the racks upon selective movement of the rows along the length of the floor.

5,062,243

OPENABLE ROOF

Takenori Kumagai, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1989, Ser. No. 440,928
Claims priority, application Japan, Nov. 24, 1988, 63-296448
Int. Cl.[5] E04B *1/346*
U.S. Cl. 52—66 **15 Claims**



1. An openable roof capable of opening and closing a central space having a certain point, said openable roof comprising;

a stationary roof section arranged in spaced relation to said certain point of said central space by a predetermined distance, said stationary roof section having an inner periphery which defines said central space;

a movable roof section arranged on said stationary roof section and radially movable relatively thereto toward and away from said certain point of said central space between an open position where said central space is open and a closed position where said central space is closed, said movable roof section being divided into a plurality of movable roof units, each of said movable roof units including a radially movable roof-structural support movable relative to said stationary roof section and a radially movable roof finish movable relative to said movable roof-structural support, said movable roof finishes having their respective apexes which are substantially identical in central angle with each other, wherein, in said closed position, said apexes of said movable roof finishes abut against each other and said movable roof units cooperate with each other to close said central space, and wherein, in said open position, said movable roof finishes are spaced from each other and are spaced from said certain point of said central space to open the latter; and

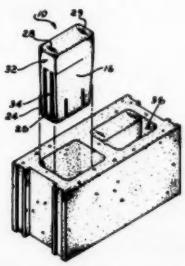
drive means for drivingly moving said movable roof units between said open and closed positions.

5,062,244

INSULATING INSERT FOR THE CORES OF BUILDING BLOCKS

Edgar R. Ducharme, 28 Shady Brook La., West Springfield, Mass. 01089

Filed Mar. 4, 1991, Ser. No. 664,091
Int. Cl.[5] E04B *1/62*
U.S. Cl. 52—98 **9 Claims**



1. An insulating insert for the cores of building blocks, said insert comprising a generally rectangular body having an upper and lower face, front and back surfaces, and sidewalls, said insert having a plurality of elongated internal cavities extending downwardly from said upper face toward said lower face and having a plurality of compression slots extending upwardly from said lower face toward said upper face and extending outwardly from said front surface to said back surface, such that said elongated internal cavities and said compression slots terminate at or beyond a common horizontal plane within said body of said insert, thereby enabling lateral compression over the full height of said insert and thereby enabling said insert to conform to the cores of different sizes and shapes of building blocks.

5,062,245

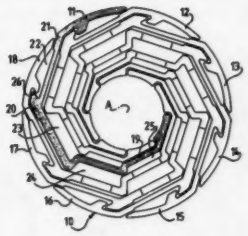
TELESCOPIC BEAM

Nigel A. Dent, Standingford House, Cave St., Oxford, OX4 1BA, England

PCT No. PCT/GB89/00553, § 371 Date Feb. 23, 1990, § 102(e) Date Feb. 23, 1990, PCT Pub. No. WO89/11575, PCT Pub. Date Nov. 30, 1989
PCT Filed May 19, 1989, Ser. No. 458,614
Claims priority, application United Kingdom, May 21, 1988, 8812063
Int. Cl.[5] E04H *12/34*
U.S. Cl. 52—118 **7 Claims**

1. An extendible beam characterized by being made up of an array of nested overlapping substantially identical members disposed substantially symmetrically about a longitudinal axis of the beam, the members having substantially arcuate cross-sections in a direction transverse the axis; each member of the array providing for angular axial alignment of that member relative to at least one other member in the array and for

slidable engagement of that member with that other member so that relative linear movement between two adjacent members



occurring during extension of the beam is constrained so as to be substantially or entirely in the direction of the axis.

5,062,246

PARTITION STRUCTURES AND FRAME ELEMENTS THEREFOR

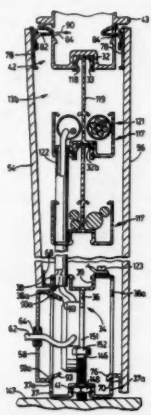
Christopher C. Sykes, 211 Queens Quay West, Apt. 902, Toronto, Ontario, Canada M5J 2M6

Continuation-in-part of Ser. No. 271,920, Nov. 16, 1988, Pat. No. 4,905,478. This application Feb. 26, 1990, Ser. No. 484,520

The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.

Int. Cl.[5] E04B *2/82*

U.S. Cl. 52—126.4 **5 Claims**



1. A modular partition structure comprising a plurality of rectangular frame elements formed by peripheral rails defining rectangular openings of uniform size therein, a plurality of rectangular panels of uniform size attaching to said frame elements substantially to fill said openings, and at least one of said frame elements being provided with a service cross beam for carrying electrical and telecommunication service members, said beam extending across an intermediate portion of one of said openings and connected at opposite ends to opposite peripheral rails of the frame element, and including a narrow panel attaching to said cross beam and to a peripheral rail of the frame element parallel thereto and substantially filling the space therebetween, and a cover plate attaching to and covering said cross beam, wherein said cross beam is of generally I-section with the upright of said I disposed parallel to the plane of the frame element, wherein said beam offers a channel section recess on each face of the frame element.

5,062,247

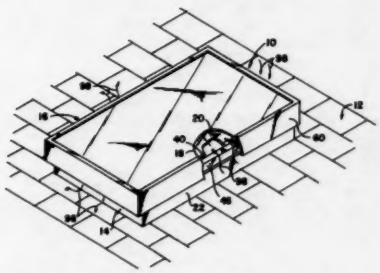
VENTILATED MULTIPLE PANE SKYLIGHT

Marlan A. Dittmer, 2000 Woodland Boulevard, Fort Myers, Fla. 33907

Filed Apr. 2, 1990, Ser. No. 504,120

Int. Cl.[5] E04B *7/18*

U.S. Cl. 52—200 **13 Claims**



1. A ventilated, multiple pane skylight comprising:

a base portion for mounting on a building to generally peripherally surround a rooftop opening therein; and

an upper portion supported by said base portion, above the rooftop opening, said upper portion including inner and outer radiation attenuating members, means for holding said members spaced apart to form an interstitial space therebetween, and air inlet and outlet means formed through said upper portion above the rooftop opening in communication with said interstitial space for allowing outside air to ventilate said space.

5,062,248

GLASS PANE INTENDED DIRECT BONDING, ESPECIALLY AUTOMOBILE GLASS PANE

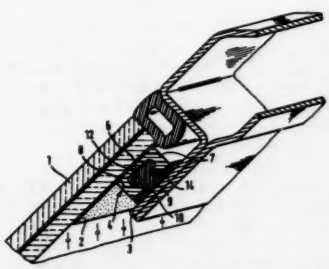
Heinz Kunert, Cologne, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 84,863, Aug. 13, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 326,441

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627536

Int. Cl.[5] E06B *3/56*; B60J *1/00*

U.S. Cl. 52—208 **13 Claims**



1. A glass pane assembly bonded to a fixing web of a window, comprising:

a glass pane;

a hardened plastic profile strand adhered to an edge portion of said pane, said profile strand having a U-shaped cross-section with flanges defining a channel shaped cavity, said flanges having anchorage projections oriented towards one another to define cut back zone with increased width as compared to a spacing between said projections; and

a hardened adhesive strand filling said channel and adhering to the fixing web of the window opening,

whereby said hardened plastic profile strand and said adhe-

sive strand are united by a form-fitting mechanical connection resulting from the width of the cut back zones being greater than the spacing between said projections.

5,062,249

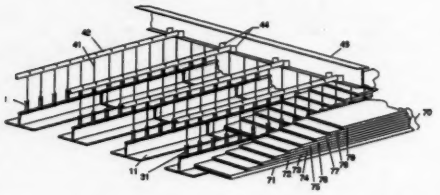
FURNACE CROWN MEANS AND METHOD

John D. Smagner, 109 South Ave., Watkins Glen, N.Y. 14891

Filed Jul. 20, 1989, Ser. No. 382,987

Int. Cl.[5] E04C *1/24*

U.S. Cl. 52—320 **12 Claims**



1. A crown structure for furnaces and kilns used to fire materials at a high temperature comprising:

a. inverted T-rails which comrise:

1. a slotted narrow attaching flange,
2. a broad base flange parallel to said narrow attaching flange and
3. a T-rail web which connects the two flanges, such that the T-rails form T-rail rows when placed end to end;

b. bone and hanger device combinations each combination including a bone and a hanger device for connection to said T-rails;

c. said bones including:

1. a T-rail attachment end with an opening for attachment to said T-rail,
2. a hanger attachment end with a hole for attachment to said hanger device and
3. a stem connecting the two ends;

d. an ultimate support system capable of supporting the kiln crown sturcture including pipes for attachment of said hanger devices;

e. layers of insulation supported by and evenly separating the T-rail rows;

f. wherein said T-rails and said bones are made of suitable heat-resistant structural materials;

g. wherein the improvement includes the following modifications:

1. said inverted T-rail is slotted forming slots along its narrow attaching flange, to allow for easier attachment and removal of the said bones, and stopper means forming stops to each side of the said slot such that the slot evenly divides the stops which thus allows said bones to be attached and positioned such that the said bones are evenly spaced upon said T-rail,
2. rigid insulation cases fitted securely and fully into the space formed between said bones, above and within the space formed between said layers of insulation and
3. said insulation cases and said T-rail stopper means combine to lock said bones providing for better support of the T-rails and thus for the entire crown stucture.

5,062,250

INSULATING PANEL SYSTEM, PANELS AND CONNECTORS THEREFOR

David Buzzella, Miami Lakes, Fla., assignor to Metal Tech, Inc., Hialeah, Fla.

Filed Feb. 27, 1990, Ser. No. 485,560

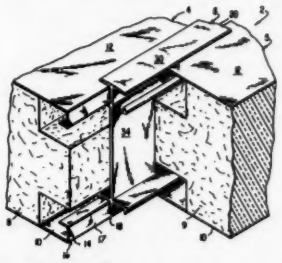
Int. Cl.[5] E04C *3/28*

U.S. Cl. 52—584 **19 Claims**

1. An insulating panel system comprising:

panel means for insulating, said panel means comprising a skin adjacent and in contact with a first face of an insulating foam core and a second skin adjacent and in contact with a second face of said insulating foam core opposite said first face, said first skin terminating in an elongated C-shaped edge and said second skin terminating in an elongated C-shaped edge, wherein portions of said foam core are cut away around said elongated C-shaped edges of said first and second skins, and wherein a plurality of said panel means are joined in adjacent relationship to form said insulating panel system; and

connecting means for joining said C-shaped elongated edges



of said first skin and said second skin of each of panel means to be joined in adjacent relationship, said connecting means comprising first channel means for receiving said C-shaped elongated edges of said first skin of adjacent panel means to be joined, and a sheet member joining said first channel means and said second channel means, wherein at least one of said first and second channel means comprises lip means for retaining elongated edges of outer skins of panels to be joined, and wherein a portion of the foam core of each panel means substantially abuts said sheet member.

5,062,251

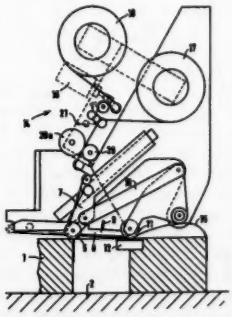
PROCESS AND DEVICE FOR APPLICATION OF A CARRYING GRIP DURING THE AUTOMATIC SEALING OF CARTONS

Werner T. Gunther, Neuss, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 190,130, May 4, 1988. This application Nov. 27, 1989, Ser. No. 441,328

Int. Cl.[5] B65B *61/14*

U.S. Cl. 53—134.1 **6 Claims**



1. A device for application of a carrying grip by means of an adhesive tape onto cartons which are continuously moving in a row past the device, each of the cartons having a front face, a longitudinal face, and a rear face, and a front edge separating the front face and the longitudinal face, and a rear edge sepa-

rating the longitudinal face from the rear face, the device comprising:

a swingable lever bar;

a front application roll on said swingable lever bar for holding the beginning of the adhesive tape, said lever bar being shiftable from a first position (a) whereby said front application roll firmly adheres the beginning of the adhesive tape to the front face of the carton, to a second position (b) on the longitudinal side of the carton;

a rear application roll mounted on said lever bar and connected with said front application roll by said lever bar and simultaneously shiftable from a first position (c) into a second position (d) which is the same height as said second position (b) of said front application roll, so that when one of the cartons moves by said front application roll in said second position (b), the adhesive tape is applied over the length of the longitudinal face of the carton in a fashion which parallels the direction in which the carton is moving:

means for actuating a handle forming assembly responsive to the front face of a carton passing; a predetermined point relative to the device, said handle forming assembly including means for forming an extra length of adhesive tape on the upper side of the carton, and means for applying a cover to the adhesive layer of a section of the adhesive tape corresponding in length to the extra length of the subsequent handle; and

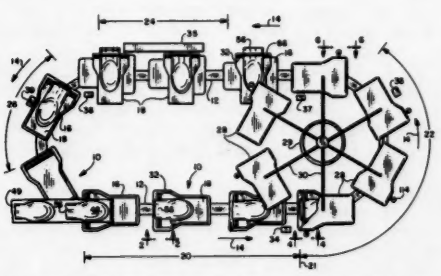
whereby as said application roll in its second position (d) moves over the rear edge of the longitudinal face of the carton, said actuating means deactivates said handle forming assembly, whereupon said rear application roll moves downward along the rear face of the carton into said first position (c) while said front application roll swings into said first position (a) and thereby firmly adheres the free end of the cut-off adhesive tape onto the rear face of the carton so as to secure the handle to the carton.

5,062,252

VACUUM PACKAGING METHOD AND APPARATUS

Vytautas Kupcikevicius, Oaklawn, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed Aug. 8, 1990, Ser. No. 564,231
Int. Cl.[5] B65B *31/02*
U.S. Cl. 53—434 **31 Claims**



1. A method of vacuum packaging articles in sealable bags comprising the steps of:

a) placing an open article-containing sealable bag at a loading zone and drawing the open neck of the bag to a flat width over a first clamp surface;

b) moving the article-containing bag and first clamp surface into an evacuation zone and at least partly evacuating air from the bag through the open neck while holding the neck at substantially its flat width over the first clamp surface;

c) moving a second clamp surface against the first clamp surface in the evacuating zone and clamping the bag neck therebetween for effecting a temporary gas-tight seal of the evacuated, article-containing bag;

d) moving the evacuated, article-containing bag from the evacuation zone through a region of atmospheric pressure to a sealing zone and maintaining said temporary gas-tight seal during said movement through the atmospheric pressure region;

e) sealing the clamped bag neck across its flat width in the sealing zone to effect a permanent gas-tight seal closure of the bag neck; and

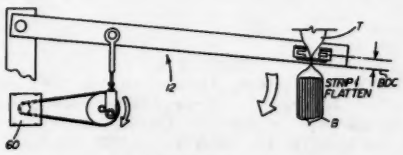
f) moving the permanently sealed, evacuated, article-containing bag from the sealing zone to an unloading zone, unclamping the bag neck and removing the permanently sealed article-containing bag from between the said clamping surfaces.

5,062,253

COMBINED FILM FEEDING STRIPPING AND SEALING FOR BAG FORMING AND METHOD

Forrest C. Bacon, and William A. Hadden, both of Conyers, Ga., assignors to Kliklok Corporation, Decatur, Ga.

Continuation of Ser. No. 304,315, Jan. 31, 1989, Pat. No. 4,996,825. This application Dec. 18, 1990, Ser. No. 629,385
The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.
Int. Cl.[5] B65B *9/08, 9/10*
U.S. Cl. 53—451 **9 Claims**



1. A combined feeding stripping and sealing apparatus for use in packaging product in a bag formed form a continuous film tube in a form, fill and seal packaging machine, comprising:

means for feeding said tube;

a carriage;

means for driving said carriage in a longitudinal direction along said tube;

sealing jaw means mounted on said carriage for movement between closed and open positions;

stripping means on said sealing jaw means for stripping the product prior to sealing;

means mounted on said carriage and connecting to said sealing jaw means for selectively moving said sealing jaw means in a first direction toward the closed position for stripping and sealing, and moving said sealing jaw means in a second direction toward the open position to release the formed bag; and

control means for at least one of said feeding means and said driving means programmable to vary the relative movement of said film and said carriage for adjustment of the stripping length;

whereby said feeding, stripping and sealing is performed in a precise manner to maximize packaging machine speed.

5,062,254

METHOD FOR MAKING AN OPTICAL FIBER COATING DISPENSER PACKAGE

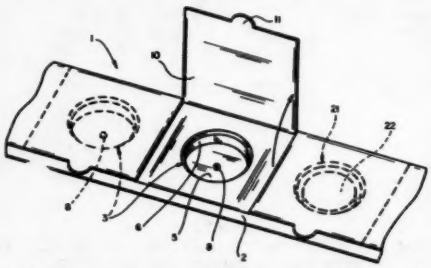
Akira Tomita, Redwood City; Stephen H. Diaz, Palo Alto; Robert S. Dubrow, and Michael Feldman, both of San Carlos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

PCT No. PCT/US89/02197, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO89/11668, PCT Pub. Date Nov. 30, 1989

PCT Filed May 19, 1989, Ser. No. 601,813

Int. Cl.[5] B05D *1/26*; B65B *7/26*

U.S. Cl. 53—467 4 Claims



1. A method of making a dispenser for dispensing a coating material onto an end of an optical fiber, comprising the steps of:

piercing an elastic membrane with a hollow needle;

ejecting only a generally spherical quantity of a coating material from the needle;

withdrawing the needle from the membrane, the membrane being constructed so as to substantially seal upon itself upon withdrawal of the needle therefrom and so as to pierce the coating material and separate a mass thereof from the needle such that the coating material mass is disposed on a top surface of the membrane.

5,062,255

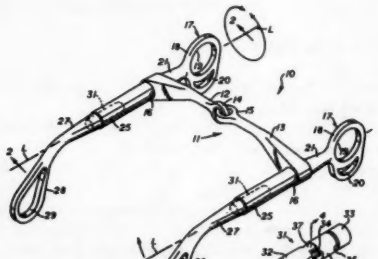
BRIDLE BIT

Ronald J. Myler, P.O. Box 143, Crockett, Tex. 75835, and Leo Benjak, 24 Barakee St., Marsden 4203 Queensland, Australia

Continuation-in-part of Ser. No. 196,073, May 19, 1988, Pat. No. 4,884,390. This application Sep. 15, 1989, Ser. No. 407,624

Int. Cl.[5] B68B *1/06*

U.S. Cl. 54—7 20 Claims



1. A bridle bit comprising

a mouthpiece member adapted to be received in the mouth of a horse and having laterally extending ends,

head stall ring members mounted on the outer ends of said mouthpiece and extending rearwardly therefrom,

a curb chain slot in said head stall ring member,

a cheek piece member extending forwardly from each lateral end of said mouthpiece to reside closely adjacent the cheek of the horse,

a rein ring member rotatably mounted on each said cheek piece member and extending forwardly therefrom and rotatable relative thereto partially about their longitudinal axes, and

means supporting said head stall ring member and cheek piece member for rotation as a unit relative to each other and relative to said mouthpiece member.

5,062,256

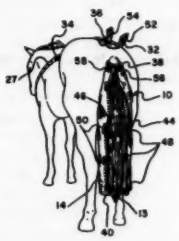
HORSE TAIL COVER AND METHOD

Betty M. Kingett, Lindenwold, N.J.; Donald L. Kingett, executor, c/o Kulzer & di Padova 76 Euclid Ave., Haddonfield, N.J. 08033, and Kingett, III, executor Albert E., Box 253 C Cohawkin Rd., Sewell, N.J. 08080

Filed Oct. 3, 1989, Ser. No. 416,487

Int. Cl.[5] B68B *5/04*

U.S. Cl. 54—78 11 Claims



1. A device to cover a horse's tail comprising:

(a) a cloth panel comprising:

(i) a top edge,

(ii) a bottom edge substantially parallel to said top edge, and

(iii) two lengthwise edges,

(b) lengthwise edge attachement means to detachably attach the lengthwise edges together to form the cloth panel into a tubular shape,

(c) top edge attachment means to detachably attach portions of the top edge together to partially close off and reduce the diameter of the top edge of the tubular shaped cloth panel,

(d) strap means attachable proximate the top edge comprising a strap of sufficient length to extend from the top of horse's tail over the horse's back, over the horse's chest above the horse's shoulders, and over the back to the top of the horse's tail, to hold up the cloth panel up under the horse's tail, and

(e) a means to detachably attach at least end portions of said bottom edge together to close off said bottom edge of said tubular shaped cloth panel.

5,062,257

MOWING APPARATUS

William M. Morris, 84 Ingleston Rd., Wakerley, 4154, Australia

Filed Jul. 9, 1990, Ser. No. 550,087

Claims priority, application Australia, Jul. 13, 1989, PJ5228; Dec. 8, 1989, PJ7764

Int. Cl.[5] A01D *34/77*

U.S. Cl. 56—11.1 10 Claims

1. Mowing apparatus for cutting grass or the like, the mowing apparatus being adapted in use to be pulled or pushed by a vehicle, comprising:

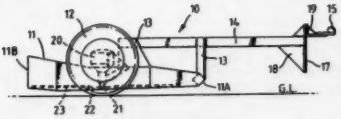
a wheeled frame;

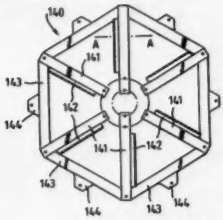
a cutting member mounted for rotation about a generally vertical axis;

drive means connected between at least one wheel of the

wheeled frame and the cutting member whereby the cutting member is located by rotation of the wheel(s);

wherein the cutting member comprises a central hub member, a plurality of equally spaced, generally flat, radial arm members having their inner ends connected to the hub member, each blade member having an upswept portion





along its trailing edge such that a downward force is exerted on the blade when it rotates rapidly through air; and

a plurality of connection members each connected between a respective pair of adjacent arm members and each being adapted to have a blade member connected thereto.

5,062,258

TERRAIN TRAVERSING APPARATUS HAVING MEANS FOR TRANSFERRING GRASS CLIPPINGS TO COLLECTION BOX

Kazuo Samejima, and Hiroaki Kawakita, both of Osaka, Japan, assignors to Kubota LTD, Osaka, Japan

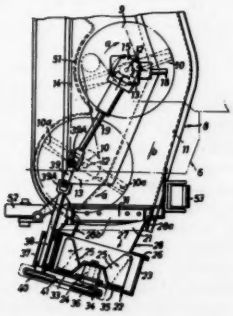
Filed Jul. 25, 1986, Ser. No. 889,364

Claims priority, application Japan, Aug. 13, 1985, 60-178313; Jan. 23, 1986, 61-13403

The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.

Int. Cl.[5] A01D *34/63, 87/10*

U.S. Cl. 56—202 **8 Claims**



1. A terrain travelling vehicle comprising:

a mower including a deck, a mower assembly having meshing bevel gears, and mower cutters, said deck having forward, rearward and two side portions, said mower cutters being driven by said mower assembly to cut grass and the like to form clippings, said mower cutters being set in said deck and being rotatable about a vertical shaft, said deck having an opening in at least one side thereof, for discharge of clippings;

a collection box for storing said clippings;

a housing connected to said discharge opening of said deck, said housing having an inner side and an outer side, said inner side having an inlet for receiving said clippings from said mower and an outlet for discharge of said clippings from said housing;

a duct assembly connecting said outlet of said housing to said collection box;

an impeller mounted within said housing, said impeller including a plurality of blades which are rotatable about and driven by a horizontal shaft such that rotation of said blades of said impeller moves said clippings from said inlet to said outlet of said housing and then moves said clippings through said duct assembly to said collection box, said horizontal shaft being mounted through said outer side of said housing such that said inlet is free of obstructions which may tend to clog clippings inn said housing;

power input means for driving at least said mower assembly;

an input shaft located between said power input means and said mower assembly, said input shaft extending in a direction generally parallel to the general direction of travel of said vehicle;

a power takeoff shaft being driven by said power input means via said mower assembly and extending from said mower assembly in a direction opposite to and at an angle offset from the general direction of travel of said vehicle; and

means for driving said horizontal shaft for rotation of said impeller, said means for driving being powered by said power takeoff shaft being located externally of said housing on said outer side thereof, said means for driving including a transmission shaft and a power receiving shaft, said power receiving shaft and a power receiving shaft, said power receiving shaft being connected to said power takeoff shaft by a universal joint and being connected to said transmission shaft by another universal joint, said power receiving shaft being generally parallel to said horizontal shaft, said means for driving said horizontal shaft further including means for belting the power receiving shaft to said horizontal shaft, said means for belting being arranged externally of said outer side of said housing, and

wherein said housing further comprises a front and rear side and wherein said horizontal shaft has a free end positioned generally midway between the front and rear side of said housing, said inlet of said housing having a top and bottom side each positioned at a predetermined elevation, and said free end being positioned at a height between said predetermined elevations.

5,062,259

ROTARY DRIVE MECHANISMS

Brian R. Lipscombe, Bishops Cleeve, England, assignor to Ultra Hydraulics Limited, Cheltenham, England

Filed May 21, 1990, Ser. No. 526,552

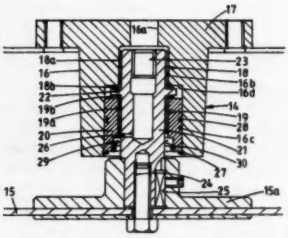
Claims priority, application United Kingdom, Apr. 4, 1990, 9007676

Int. Cl.[5] A01D *55/18*

U.S. Cl. 56—255 **11 Claims**

1. A rotary drive mechanism comprising an hydraulic motor, a shaft rotatable by the hydraulic motor, a blade connected to the shaft, and a bearing assembly supporting the shaft, the

bearing assembly comprising a bearing housing, a plain journal bearing mounted in said housing, a thrust bearing also mounted



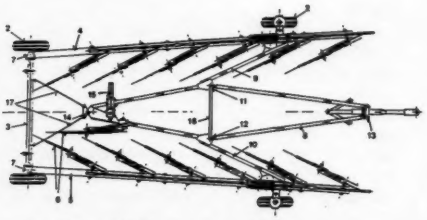
in said housing, and means for lubricating the journal and thrust bearings with hydraulic fluid from the hydraulic motor.

5,062,260

PULL TYPE BIFOLD HAY RAKE

Carletto Tonutti, Tricesimo, Italy, assignor to Tonutti S.P.A., Italy

Filed Sep. 25, 1990, Ser. No. 587,400
Claims priority, application Italy, Mar. 2, 1990, 83341/90[U]
Int. Cl.[5] A01D *78/00*
U.S. Cl. 56—380 **12 Claims**



1. A pull type bifold rake, comprising:
a cross member;
a pair of rake arms, each having a plurality of rotatable rake wheels mounted thereto, and each rake arm being pivotably mounted at one of its ends to the cross member; and
a closed polygonal frame assembly disposed between the pair of rake arms and being interconnected with each rake arm at a point spaced from the pivotable mounting of each rake arm to the cross member, the frame assembly being movable between an operative position in which the frame assembly assumes a first closed polygonal configuration and in which the rake arms are pivoted about their pivotable mounting to the cross member away from each other to a position in which they are non-parallel to each other to form substantially a V-shape when viewed in plan, and a retracted position in which the frame assembly assumes a second closed polygonal configuration and in which the rake arms are pivoted inwardly toward each other; and
means for moving the frame assembly between its operative position and its retracted position.

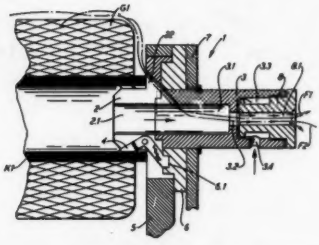
5,062,261

METHOD AND APPARATUS FOR TRANSPORTING A YARN PACKAGE TO A YARN PROCESSING MACHINE

Heinz Fink, Krefeld, Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Jan. 18, 1990, Ser. No. 467,169
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1989, 3901770
Int. Cl.[5] D01H *9/18*
U.S. Cl. 57—281 **7 Claims**

1. Method of transporting a wound hollow yarn package having a loose yarn end from a yarn processing machine while maintaining the loose yarn end in defined and fixed positions; said method comprising the steps of:
gripping the yarn package in the yarn processing machine by inserting a hollow gripper device into one end of the hollow yarn package;
pneumatically positioning the loose yarn end from the gripped yarn package in the hollow gripper device;



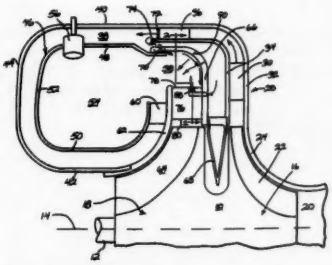
removing the yarn package from the yarn processing machine and placing the yarn package on a hollow pin of a transporting mechanism by the gripper device;
pneumatically removing the loose yarn end of the yarn package from the gripper device and positioning the yarn end in the hollow pin of the transporting mechanism;
removing the gripper device; and
transporting the yarn package.

5,062,262

COOLING OF TURBINE NOZZLES

Jack R. Shekleton, San Diego, Calif., and Douglas C. Johnson, Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 28, 1988, Ser. No. 291,056
Int. Cl.[5] F02C *3/05*
U.S. Cl. 60—39.36 **10 Claims**



1. A gas turbine comprising:
a rotary compressor;
a radial inflow turbine wheel mounted for rotation and coupled to said compressor;
an annular nozzle and shroud structure surrounding said turbine wheel and including an annular, generally radially extending front shroud on one side of said turbine wheel, an annular, radially and axially extending rear shroud on the opposite side of said turbine wheel and a plurality of vanes interposed between and supported by said shrouds radially outwardly of said turbine wheel, said vanes having leading edges remote from said turbine wheel and downstream edges oppositely thereof;
a combustor for receiving compressed air from said compressor and fuel from a source, combusting the same and providing hot gases of combustion to said nozzle and shroud structure at the leading edges of said vanes;
at least one passage in each said vane; and

means associated with said compressed air for providing compressed air to said passages;

said passages having means for defining an opening in the associated leading edge generally centrally of said vane sized to provide resistance to plugging by contaminants present in said compressed air.

5,062,263

EXHAUST GAS DEPURATOR HAVING A CATALYTIC ACTIVITY, AND SILENCER, FOR INTERNAL COMBUSTION ENGINES

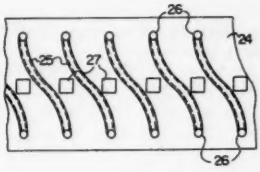
Luigi Carboni, Turin, Italy, assignor to Luciano Bonansea, Turin, Italy and I.R.T.I. Istituto Di Ricera E Trasferimenti Tecnologic Alle Imprese srl, Rome, both of, Italy, a part interest to each

Filed Mar. 14, 1990, Ser. No. 493,314

Claims priority, application Italy, Apr. 12, 1989, 67264 A/89

Int. Cl.[5] F01N *3/28*

U.S. Cl. 60—299 **11 Claims**



1. An exhaust gas depurator having a catalytic activity, for internal combustion engines, further acting as discharge silencer, comprising the combination of:

at least one element having a catalytic activity, said element having a catalytic activity including a strip of metal sheet covered by a catalytically active material and wound to a spiral of several coils, said strip having a number of drawn projections, inclined with respect to the longitudinal and transverse directions of the strip, acting as spacers among the winding coils of the strip and acting as baffles for the exhaust gas flow, said inclined projections having a sinuous shape, each said projection showing on a half thereof a curvature directed towards one side, and on the other half thereof a curvature directed towards the opposite side; and

at least one substantially non-dissipative noise silencer.

5,062,264

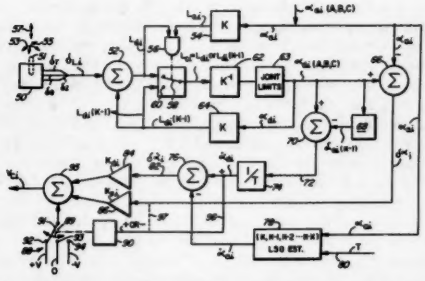
HYDRAULIC CONTROL SYSTEM

Réal N. Frenette, and Peter D. Lawrence, both of Vancouver, Canada, assignors to The University of British Columbia

Filed Jul. 24, 1990, Ser. No. 556,417

Int. Cl.[5] F16D *31/00*; B66C *23/00*

U.S. Cl. 60—427 **18 Claims**



1. A motion control system for actuators adapted to move arm segments of an articulated arm, said arm segments being interconnected by joints comprising a control means generating δr, δΘ and δz signals for r, Θ and z directional movements of an end point at the free end of an arm segment, actuator means for displacing each said arm segment relative to one of said joints, means to actuate each of said actuators as required to obtain a desired movement of said end point as directed by said r, Θ, and z signals, means to measure the actual joint position of each of said joints, means to determine the desired joint position of each of said joints, means to determine the actual end point location of said end point, means to calculate a new desired end point location based on said δr, δΘ and δz signals and the previous desired end point location of said end point, means to compare said determined actual end point location with said calculated new desired end point location, means to send modified r, Θ and z signals to adjust the joint position of said joints if said actual end point location differs from said new desired end point location by more than a preset limit and means to generate control signals to control the operation of said actuating means to obtain the desired movement of said end point based on said modified r, Θ and z signals to reduce the discrepancy between said actual end point location and said new desired end point location.

5,062,265

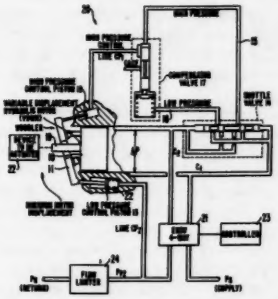
HYDROMECHANICAL CONTROL OF DIFFERENTIAL PRESSURE ACROSS A VARIABLE DISPLACEMENT HYDRAULIC MOTOR

Albert L. Markunas, Roscoe, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 1, 1989, Ser. No. 387,986

Int. Cl.[5] F15B *11/02*; F03C *1/40*

U.S. Cl. 60—450 **13 Claims**



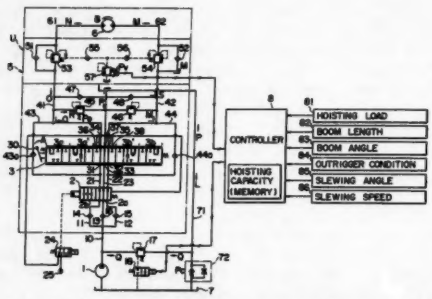
5. An apparatus for mechanically actuating a device with a variable displacement hydraulic motor driven by hydraulic fluid from a hydraulic power supply, comprising a device to be mechanically actuated, a variable displacement hydraulic motor, means for mechanically connecting the output of the motor to said device for actuatting said device, a hydraulic power supply for supplying hydraulic fluid for driving the motor, fluid passage means for supplying pressurized hydraulic fluid to the motor from said hydraulic power supply and for returning pressurized hydraulic fluid from the motor to the hydraulic power supply, and means responsive to the hydraulic pressure differential between said supply pressurized fluid and said return pressurized fluid for controlling the hydraulic pressure differential across the motor by adjusting the displacement of the motor to maintain a near constant hydraulic pressure differential across the motor when the motor is operating under an opposing load in an intermediate region of its speed-load torque profile, and including means responsive to the pressure of the return pressurized fluid for automatically reducing and maintaining the displacement of the motor to a minimum when the motor is operating under an aiding load.

5,062,266

SLEWING CONTROL DEVICE FOR CRANE

Hideaki Yoshimatsu, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 23, 1990, Ser. No. 571,108
Int. Cl.[5] F15B *11/04*
U.S. Cl. 60—466 2 Claims



1. A slewing control device for a crane for supplying a discharge oil from a pump through a direction selecting valve to a slewing motor and for controlling a rotational direction of said slewing motor, said slewing control device comprising:

a main circuit including select means provided between said pump and said direction selecting valve, said select means selecting either an unload condition of said pump where a hydraulic oil in said main circuit is communicated with a tank or an on-load condition of said pump where communication between said main circuit and said tank is blocked;

a first check valve provided between said direction selecting valve and a suction port of said slewing motor;

a second check valve provided between said direction selecting valve and a discharge port of said slewing motor, said first and second check valves permitting flow of said hydraulic oil from said direction selecting valve to said slewing motor;

a first electromagnetic proportional pressure control valve provided between said direction selecting valve and said suction port of said slewing motor in parallel with said first check valve;

a second electromagnetic proportional pressure control valve provided between said direction selecting valve and said discharge port of said slewing motor in parallel with said second check valve, said first and second electromagnetic proportional pressure control valves controlling pressure of oil discharged from said slewing motor to said direction selecting valve; and

control means for outputting a select signal to said select means to select said unload condition and also for outputting a pressure control signal to said second electromagnetic proportional pressure control valve between said direction selecting valve and said discharge port to control oil pressure on a discharge side of said slewing motor to stop rotation of said slewing motor.

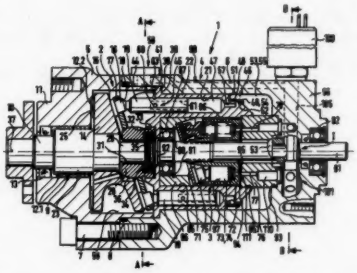
5,062,267

HYDROSTATIC TRANSMISSION CONTAINING AN AXIAL PISTON MOTOR LOCATED IN A RECESS OF A VALVE CONTROLLED AXIAL PISTON PUMP

Rainer Stölzer, Ulm, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,940
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1988, 3841382
Int. Cl.[5] F16D *39/00*
U.S. Cl. 60—493 22 Claims

20. A hydrostatic transmission comprising a housing containing an axial piston pump, which includes a first drive part rotatably driven by a drive shaft, and a stationary cylinder block with pistons, and comprising an axial piston motor, connected to said pump by at least one hydraulic line, wherein said motor comprises a non-rotatable second drive part and a rotatable cylinder drum and is integrated in the pump housing on a side opposite to said first drive part, the cylinder drum



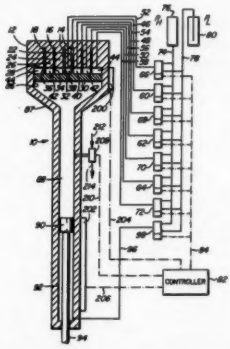
being fixed non-rotatably on an output shaft and being arranged at least partly on an output shaft and being arranged at least partly in a recess in the cylinder block of said pump said transmission also including a pressure chamber of said pump defined by an output side end wall of the housing and said cylinder block.

5,062,268

FLUID ACTUATOR

Andrew B. Dunwoody, Richmond, Canada, assignor to The University of British Columbia, Canada

Continuation-in-part of Ser. No. 473,748, Feb. 2, 1990. This application Sep. 20, 1990, Ser. No. 585,524
Int. Cl.[5] F15B *7/00*
U.S. Cl. 60—533 16 Claims



1. A digital hydraulic actuator comprising a fixed element, a driven piston cooperating with a first cylinder formed by said fixed element, means to digitally vary the pressure acting between said fixed element and said driven piston tending to displace said driven piston in said first cylinder, said means to digitally vary the pressure acting between said fixed element and said driven piston including a first set of different cross sectional area piston cavities and a first set of different cross section area pistons on said fixed element, a second set of different cross sectional area pistons and a second set of different cross sectional area piston cavities on said driven piston, each piston of said second set of pistons being received within said one of said cavities of said first set of piston cavities and each cavity of said second set of piston cavities receiving a piston of said first set of pistons, and means to selectively apply fluid under selected pressures to each cavity of said first and

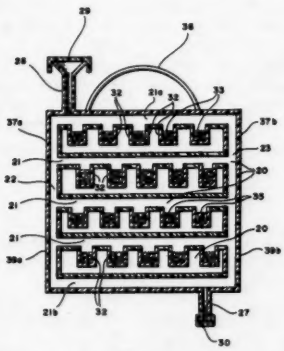
said second sets of cavities, a second cylinder, a hydraulic coupling hydraulically connecting said first cylinder to said second cylinder, said second cylinder having a cross sectional area different from said first cylinder, a working piston in said second cylinder adapted to apply a force determined by the ratio of the cross sectional areas of said first and second cylinders.

5,062,269

DISPOSABLE BODY COOLER

Israel Siegel, 2980 Point East Dr., N. Miami Beach, Fla. 33160

Filed Feb. 19, 1991, Ser. No. 656,458
Int. Cl.[5] F25D 5/02
U.S. Cl. 62—4 8 Claims



1. A disposable wearable cooling device said device consist of a network of inter-communicating containers,

said containers adapted to fit body contour,

a solid component which induces an endothermic reaction when mixed with water distributed in said containers,

means to fix said solid component in pre-determined locations in said containers to obtain an even distribution of said solid component in said containers,

and a reversible communication of said containers with the outside environment to allow the addition of water to said solid endothermic component.

5,062,270

METHOD AND APPARATUS TO START-UP CONTROLLED FREEZING ZONE PROCESS AND PURIFY THE PRODUCT STREAM

Richard C. Haut, Stavanger, Norway; Eugene R. Thomas, Midland, and Robert D. Denton, Houston, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.*

Filed Aug. 31, 1990, Ser. No. 576,059
Int. Cl.[5] F25J 5/00
U.S. Cl. 62—12 60 Claims

1. A method for start-up of a distillation column with a controlled freezing zone comprising the steps:

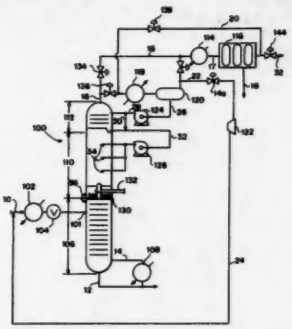
feeding a mixture of at least one acid gas and methane to a lower distillation zone;

producing in said lower distillation zone an enriched carbon dioxide liquid bottoms stream and a freezing zone vapor feedstream at a temperature and pressure at which substantially no carbon dioxide solids are formed;

contacting said freezing zone vapor feedstream with at least one freezing zone liquid feedstream containing methane in a controlled freezing zone at a temperature and pressure wherein both solids containing carbon dioxide and a methane-enriched vapor stream are formed;

stripping the acid gas component from the methane-enriched vapor stream to produce an acid gas stripped stream;

separating said stripped stream into liquid and vapor components; and



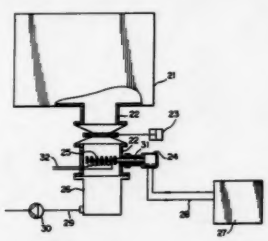
refluxing the liquid component of said stripped stream to the distillation column.

5,062,271

EVACUATION APPARATUS AND EVACUATION METHOD

Katsuya Okumura; Fumio Kuriyama; Yukio Murai; Manabu Tsujimura, and Hiroshi Sobukawa, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Ebara Corporation, Tokyo, both of, Japan

Filed May 4, 1990, Ser. No. 519,377
Claims priority, application Japan, May 9, 1989, 1-114166
Int. Cl.[5] B01D 8/00
U.S. Cl. 62—55.5 8 Claims



1. An evacuation apparatus operatively connectable to a vacuum vessel to be evacuated, said apparatus comprising:

a turbomolecular pump having a rotor provided with a plurality of rotor blades and a spacer provided with a plurality of stator blades, said turbomolecular pump operating so that gas molecules are sucked in from a suction port, compressed and discharged from an exhaust port;

a heat exchanger operatively connected to said suction port of said turbomolecular pump for freeze-trapping gas molecules in said heat exchanger;

a helium refrigerator connected to said heat exchanger for cooling said heat exchanger to a temperature of −100° C.;

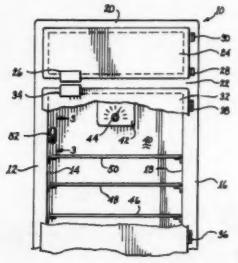
a gate valve operatively connected at an upstream side of said heat exchanger for controlling inflow of the gas molecules from said vacuum vessel into said heat exchanger.

5,062,272

REFRIGERATOR OR FREEZER FRESHENING DEVICE AND PROCESS

Marsha L. Burns, Casa Grande, Ariz., assignor to MarShel Corporation, Mesa, Ariz.

Filed Oct. 9, 1990, Ser. No. 594,332
Int. Cl.[5] F24F *3/16*
U.S. Cl. 62—78 10 Claims



10. The process of replacing an unwanted odor in a refrigerator or freezer compartment with a fruit extract scent including the steps of:

mounting a freshener unit having a perforated front plate and a perforated rear plate and peripheral plate with a chamber on an inner surface of a wall of the refrigerator or freezer and offset from the inner surface;

placing a particle mixture containing by weight about 5 percent food or fruit extract and about 47 percent carbon filter type particles and about 48 percent sodium carbonate particles in the chamber; and

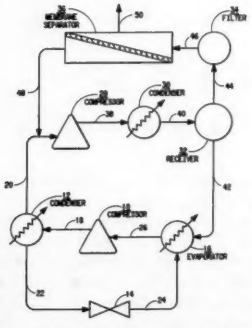
circulating air with the unwanted odor through the front and rear plates and the particle mixture.

5,062,273

METHOD AND APPARATUS FOR REMOVAL OF GAS FROM REFRIGERATION SYSTEM

Kung H. Lee, Chadds Ford, Pa., and Earl M. Clark, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 12, 1990, Ser. No. 551,954
Int. Cl.[5] F25B *47/00*
U.S. Cl. 62—85 8 Claims



1. In a process wherein a halocarbon refrigerant is circulated, by use of a first compressor, from the high pressure outlet of the first compressor sequentially through a first condenser, a fluid expansion valve and an evaporator and then back to the low pressure inlet side of the compressor, the specific improvement comprising the steps of:

(a) withdrawing at least a portion of the vapor phase present between the high pressure outlet of said first compressor and the high pressure side of said expansion valve means, wherein said vapor phase withdrawn contains non-condensible contaminants;

(b) subjecting said vapor phase containing non-condensible contaminant of step (a) to a second compression to an even higher pressure;

(c) passing the high pressure compressed vapor phase of step (b) through a second condenser to produce a condensed liquid phase halocarbon and a vapor phase enriched in non-condensible contaminant;

(d) separating said liquid phase halocarbon produced in step (c) and returning said liquid phase halocarbon back to the liquid phase halocarbon refrigerant to be passed through an evaporator;

(e) passing said vapor phase enriched in non-condensible contaminant produced in step (c) through a semipermeable membrane means to form a halocarbon enriched/non-condensible contaminant depleted first stream and a non-condensible contaminant enriched/halo-carbon depleted second stream;

(f) recycling said halocarbon enriched/non-condensible contaminant depleted first stream produced in step (e) to the inlet side of said second compression step (b); and

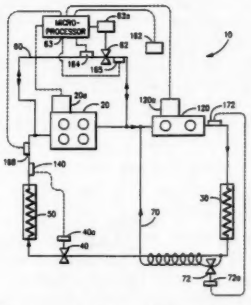
(g) removing said non-condensible contaminant enriched/halocarbon depleted second stream produced in step (e) from further circulation.

5,062,274

UNLOADING SYSTEM FOR TWO COMPRESSORS

David N. Shaw, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 374,907, Jul. 3, 1989, Pat. No. 4,938,029. This application Jun. 28, 1990, Ser. No. 546,211
Int. Cl.[5] F25B *41/04*
U.S. Cl. 62—117 9 Claims



1. An unloading system for a refrigeration system comprising:

a first closed fluid loop serially including a first stage compressor means, a second stage compressor means, a condenser means, expansion means and evaporator means;

a second fluid loop defining bypass means and fluidly connected to said first loop between a first end located intermediate said first and second stages and a second end located intermediate said evaporator means and said first stage;

first valve means located in said second loop for unloading said first stage back to said second end of said second loop when said first valve means is open and said first stage compressor means is running and for bypassing said first stage from said second end to said first end of said second fluid loop when said first valve means is opened and said first compressor means is shut off;

a third fluid loop defining an economizer means and fluidly connected to said first loop between a first end located intermediate said condenser means and said expansion

means and a second end located intermediate said first and second stages;

second valve means in said third loop for providing an economizer flow;

whereby when said first valve means is fully open said second stage alone must handle refrigerant vapor generated by both said evaporator means and said economizer means thereby unloading said refrigeration system.

5,062,275

AUTOMOTIVE AIR CONDITIONER

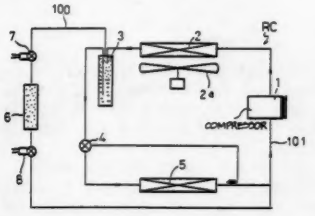
Toshio Hirata, Anjo; Kenji Ogura, Kariya, and Takehito Mizutani, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 8, 1990, Ser. No. 489,188

Claims priority, application Japan, Mar. 9, 1989, 1-54994; Mar. 11, 1989, 1-58602

Int. Cl.[5] F25B *41/00*

U.S. Cl. 62—174 **9 Claims**



1. An automotive air conditioner comprising:

a compressor for introducing a mixed coolant mixing a higher boiling point coolant and a lower boiling point coolant and for compressing and discharging the coolant,

a condenser for receiving a compressed coolant from said compressor and condensing the coolant,

a receiver for receiving the condensed coolant from said condenser and stacking the condensed coolant therein so that a condensed liquid phase coolant is stacked in the lower portion of said receiver and a gas phase coolant is positioned in an upper portion of aid receiver,

an expansion valve for receiving the liquid phase coolant from said receiver and expanding the coolant,

an evaporator for receiving the expanded coolant from said expansion valve and evaporating the coolant therein,

a conduit for connecting said compressor, said condenser, said receiver, said expansion valve and said evaporator for forming a refrigerant circuit,

a stacking container connected to the upper portion of said receiver for receiving the gas phase coolant in said receiver and connecting to a suction side of said compressor for flowing the coolant within said stacking container toward said compressor, said stacking container stacking a coolant therein,

a first valve provided on a conduit connecting said receiver and said stacking container for controlling a flow of the coolant from said receiver to said stacking container,

a second valve provided on a conduit connecting said stacking container and the suction side of said compressor for controlling a flow of the coolant from said stacking container toward said compressor, and

a controlling unit for controlling an operation of said first valve and said second valve so that the lower boiling point coolant is separate from the refrigerant circuit and stacked in said stacking container when the automotive air conditioner is in a separating mode and that the lower boiling point coolant is mixed with the higher boiling point coolant and the mixed coolant circulates in the refrigerant circuit when the automotive air conditioner is in a mixing mode.

5,062,276

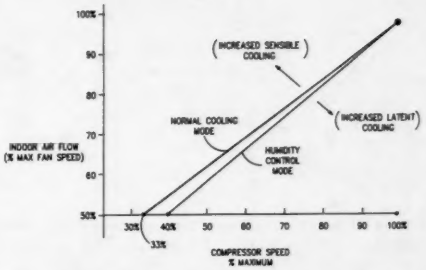
HUMIDITY CONTROL FOR VARIABLE SPEED AIR CONDITIONER

Kevin F. Dudley, Cazenovia, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 20, 1990, Ser. No. 585,607

Int. Cl.[5] F25B *49/00*

U.S. Cl. 62—176.6 **9 Claims**



1. A process for controlling an air conditioning system to control temperature and humidity wherein the air conditioner system comprises a variable speed compressor whose operating speed is varied as a function of cooling demand between a normal minimum compressor speed for low cooling demand and full compressor speed for high cooling demand; outdoor heat exchanger means coupled to a discharge outlet of the compressor for receiving compressed refrigerant therefrom and transferring heat to outdoor air; and indoor heat exchanger means for cooling and dehumidifying air in an indoor comfort space including an evaporator coil to receive condensed refrigerant from the outdoor heat exchanger means and having an outlet coupled to a return port of said compressor; and a variable speed fan for blowing the air of the comfort space at a controlled flow rate over said evaporator coil to reduce its temperature and to remove water vapor therefrom, the fan speed being varied with said cooling demand to vary with said compressor speed and with relative humidity in the comfort space from a minimum fan speed at a low cooling demand to a maximum speed at high cooling demand; the method comprising:

sensing the cooling demand in said comfort space,

sensing the relative humidity in said comfort space,

controlling the fan speed so that the air flow varies as a function of the cooling demand and relative humidity between said minimum fan speed and said maximum fan speed;

if the relative humidity is below a predetermined level, controlling the compressor speed as a function of said cooling demand between said normal minimum compressor speed and said full compressor speed; but

if the relative humidity is above said predetermined level, controlling the compressor speed as a function of said cooling demand that is substantially linear between a dehumidification minimum compressor speed, higher than said normal minimum speed, and said full compressor speed; and

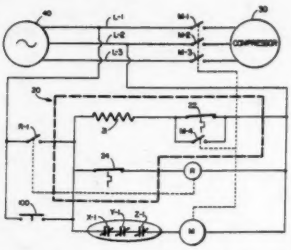
controlling the fan speed to have a speed in the range between said minimum fan speed and said maximum fan speed, with a first linear relation relative to the compressor speed between said normal minimum compressor speed and said full compressor speed when the relative humidity is below said predetermined level, and with second linear relation relative to the compressor speed between said dehumidification minimum compressor speed and said full compressor speed when the relative humidity is above said predetermined level.

5,062,277

COMBINED OIL HEATER AND LEVEL SENSOR

Erric L. Heitmann, Clay, and David N. Shaw, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 29, 1990, Ser. No. 604,310
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—193 6 Claims



1. In an oil sump containing oil for lubricating a drive means, a combined oil heater and liquid level sensor means comprising:

heater means normally located within said oil in said oil sump for heating said oil;

normally closed thermal protection means located near said heater means in said sump;

a source of electric power;

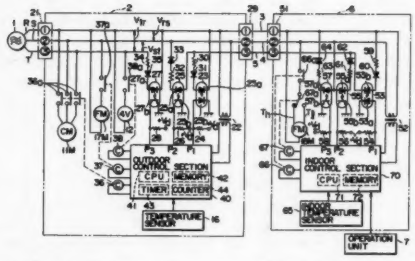
electrical circuit means connecting said source of electric power to said heater means, said thermal protection means and said drive means whereby said heater means heats said oil in said sump with said oil acting as a heat sink when said heater means is in said oil and connected to said source of electric power and said heater means causes said normally closed thermal protection means to open and cause a break in said circuit means responsive to said heater means being connected to said source of electric power and located above said oil thereby disabling said drive means.

5,062,278

AIR-CONDITIONING APPARATUS INCLUDING AN INDOOR UNIT AND AN OUTDOOR UNIT HAVING ITS COMPRESSOR DRIVEN BY A THREE-PHASE AC POWER SUPPLY

Akiyoshi Sugiyama, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 31, 1990, Ser. No. 636,429
Claims priority, application Japan, Feb. 23, 1990, 2-40919
Int. Cl.[5] F25B *49/02*; H02H *7/00*
U.S. Cl. 62—230 8 Claims



1. An air-conditioning apparatus, including an indoor unit and an outdoor unit having its compressor driven by a three-phase alternating-current power supply, comprising:

means, provided at at least one of the units, for preparing a serial signal corresponding to to-be-transmitted information in synchronism with a first line voltage of the three-phase alternating-current power supply and for transmitting the serial signal to the other unit;

means, provided at at least one of the units, for receiving the serial signal sent from the corresponding unit and determining the contents of the serial signal;

means for detecting one of a second and a third line voltages of the three-phase alternating-current power supply;

means for detecting a difference between a phase angle of the detected line voltage and that of the serial signal;

means for comparing the detected difference with set values;

means for determining, in accordance with the result of comparison, whether the three-phase alternating-current power supply is in a positive-phase sequence or in a negative-phase sequence; and

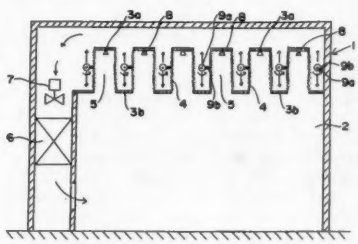
means for inhibiting an operation of the compressor when the negative-phase sequence is determined by the determining means.

5,062,279

ARTIFICIAL SNOWFALL SYSTEM

Ichiro Kawashima, Tokyo; Mitsuo Seki, Atsugi, and Isao Hirano, Toda, all of Japan, assignors to Kabushikigaisha Toyo Seisakusho, Tokyo and Marubeni Kabushikigaisha, Osaka, both of, Japan

Filed Feb. 4, 1991, Ser. No. 649,989
Claims priority, application Japan, Feb. 9, 1990, 2-30540
Int. Cl.[5] A63C *19/10*
U.S. Cl. 62—235 6 Claims



1. An artificial snowfall system comprising:

a snowfall room;

a snow catching element disposed in said snowfall room, said snow catching element being made of an air-permeable material;

an atomizer unit for ejecting atomized particles of liquid into said snowfall room, said atomizer unit being disposed in said snowfall room;

ambient air within said snowfall room, in operation of the system, being kept at a temperature below freezing point of said liquid, and forming an air flow passing through said snow catching element to cause said atomized particles to be frozen by heat exchange with said ambient air and also to cause said atomized and frozen particles to be deposited on one side of said snow catching element so as to form a snow layer thereon; and

a beater element for beating the other side of said snow catching element, said beater element being oppositely disposed from said one side of said snow catching element to cause said snow layer to be separated from said one side of said snow catching element in a flake-like state during the beating operation thereof;

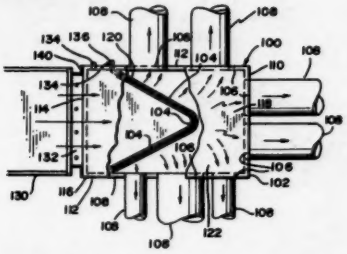
whereby said snow layer when separated from said one side of said snow catching element creates artificial snowfall in said snowfall room.

5,062,280

AIR CONDITIONING APPARATUS

Lendell Martin, Sr., 7037 Brittmore, Houston, Tex. 77041

Filed Oct. 31, 1990, Ser. No. 606,896
Int. Cl.[5] F25D *21/14*
U.S. Cl. 62—291 4 Claims



2. A device for conditioning air, the device comprising

an enclosure having an interior,

an air conditioning coil with a plurality of vanes disposed in the enclosure,

a first opening in the enclosure through which unconditioned air flows to the coil,

at least one second opening in the enclosure to which flows air conditioned by the coil and from which air flows to an air-conveying means for conveying conditioned air from the enclosure.

the coil's vanes directing air in the general direction of the at least one second opening,

a connection member for connecting the device to an outlet of an air-conveying apparatus, the connection members comprising movable members for accommodating outlets of different size,

connections extending from the coil through which conditioning fluid flows, the connections extending through a service door movably connected to the enclosure for providing access to this interior,

a drain pan disposed beneath the coil, the drain pan having means for transferring drained liquid therefrom,

the means for transferring drained liquid is at least one drain nipple, the drain nipple extending through the service door,

the enclosure is generally cubical having four side walls and a top wall and a bottom wall,

the coil V-shaped with the point of the V pointing away from a first sidewall and toward another sidewall,

each of the side walls other than the first sidewall having at least one opening therein from which air exits the enclosure, and

the vanes directing air conditioned by the coil in the general direction of each sidewall other than the first sidewall, and

the enclosure comprised of an insulative material with a top and bottom over the insulative material made from metal.

5,062,281

AIR CONDITIONING DEVICE

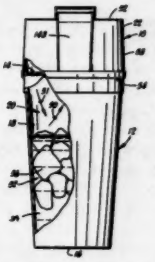
Sameul C. Oliphant, 13217 Green Valley Dr., Oklahoma City, Okla. 73120, and David E. Gormley, Pocola, Okla., assignors to Samuel C. Oliphant, Oklahoma City, Okla.

Filed Jan. 7, 1991, Ser. No. 638,270
Int. Cl.[5] F25D *3/08*
U.S. Cl. 62—457.1 26 Claims

1. An air conditioning device adapted to be used with a cup having an upper end, a lower end and a cup opening intersecting the upper end extending a distance therethrough forming a cup space and a air conditioning substance disposed in the cup space, the air conditioning device comprising:

a lid removably connectable to the upper end of the cup and having an air entry opening and an air exit opening, the air entry opening being spaced a distance from the air exit opening; and

blower assembly means connected to the lid with a portion of the blower assembly means being in communication with the air entry opening and being conditionable in an ON and an OFF condition for blowing air into the air



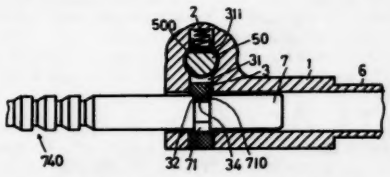
entry opening in an ON condition of the blower assembly means providing an air entry stream, the air entry stream passing through the air entry opening and into the cup space and the air passing over the substance and providing an air exit stream and the air exit stream passing through the cup space and through the air exit opening.

5,062,282

AUTOMOBILE STEERING LOCK WITH A ROD ANTI-RELEASING MECHANISM

Wang C. Rong, No. 27, Alley 74, Lane 313, Wen-Hsien Road, Tainan, Taiwan

Filed Jul. 16, 1990, Ser. No. 552,877
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 1 Claim



1. An antitheft device for attachment to a steering wheel of an automobile comprising:

an elongated tubular member having an inner end, an outer end and an elongated passageway extending along its axis therethrough, said tubular member having a first U-shaped hook portion extending therefrom with the closed end of the U-shaped hook portion generally adjacent to and slightly spaced from the inner end of said tubular member and the open end of said U-shaped hook portion facing said outer end of said tubular member, but substantially removed therefrom, said U-shaped hook portion of said tubular member further defined by a bottom leg portion generally extending in the direction of said tubular member's axis and terminating at a distance substantially removed from said outer end of said tubular member, said U-shaped hook portion of said tubular member adapted to engage said steering wheel from the inside thereof with said outer end of said tubular member extending a substantial distance beyond the periphery of said steering wheel;

a rod member having an elongated rod adapted to extend in a telescopic manner within said elongated passageway of said tubular member and a second U-shaped hook secured to one end of the rod member having an opening facing

opposite to the first U-shaped hook portion and adapted to engage said steering wheel from the inside thereof;

a plurality of spaced first annular grooves each first groove defined by a vertical side wall extending generally perpendicular to the longitudinal direction of the rod member and a sloped side wall extending obliquely to the longitudinal direction of the rod member, each first annular groove circumferentially formed in a portion of the rod member;

a second annular groove defined by opposite vertical side walls extending substantially perpendicular to the longitudinal direction of the rod member and circumferentially formed in an end portion of the rod member opposite to the second U-shaped hook;

a housing means firmly formed around an end portion of the tubular member with the elongated passageway of the tubular member extending therethrough;

a lock having a locking member extending horizontally and having at least one side of longer dimension and one side of shorter dimension;

means offset with respect to the axis of the tubular member in the housing means for firmly receiving the lock;

a vertical passageway vertically formed in the housing means and interconnecting bore means and the passageway in the tubular means in the housing means;

rod-like bearing means slidably accommodated in the vertical passageway beside the lock and having a tenon member attached to an end thereof and arranged to be actuated between a locking position with the tenon member protruding into one of the first annular grooves or the second annular groove in the rod member and an unlocking position with the tenon member withdrawn from first or second annular groove and opposed vertical side walls between the locking member being controlled to position the tenon member in locking or unlocking position through the rod-like bearing member by means of the locking member; and

a spring member disposed in the vertical passageway and biasing the rod-like bearing means towards the passageway in the tubular member, such that engagement of the tenon member and the second annular groove prohibits longitudinal movement of the rod member in a longitudinal direction so as to prevent inadvertent disengagement of the rod member from the elongated tubular member.

5,062,283

PRESS BRAKE AND A WORKPIECE MEASURING METHOD IN THE PRESS BRAKE

Naoomi Miyagawa, Gifu; Chiyoaki Yoshida, Aichi; Kazuyuki Toda, Aichi, and Yukiyasu Nakamura, Aichi, all of Japan, assignors to Yamazaki Mazak Kabushiki Kaisha, Aichi, Japan

Filed Jul. 12, 1989, Ser. No. 378,622

Claims priority, application Japan, Jul. 19, 1988, 63-179398; Nov. 22, 1988, 63-294947

Int. Cl.[5] B21D *5/02*

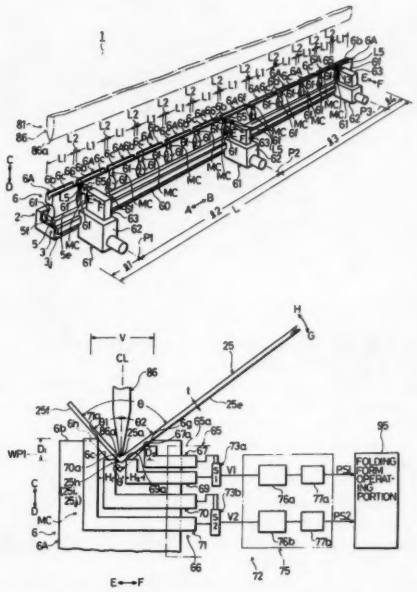
U.S. Cl. 72—10 **11 Claims**

1. A press brake comprising:

a lower die disposed in a horizontal position and an upper die movable in up and down directions out of and into workpiece shaping relationship with said lower die for bending a workpiece so that it has a bent portion;

at least one workpiece measuring portion provided on said lower die;

at least one workpiece measuring means at said workpiece measuring portion, said workpiece measuring means having at least two pairs of probes movable in up and down directions, said two pairs of probes being disposed on opposite sides of the bent portion of the workpiece which is in said lower die, a workpiece contacting portion on each of said probes for contacting said workpiece as said probes are moved upwardly in said lower die, and a displacement detecting means connected to said workpiece measuring means for detecting relative displacement in the up and down directions between said probes of each



pair of probes as said probes respectively engage the workpiece.

5,062,284

METHOD OF FABRICATING A BENT METAL BODY WITH HARDENABLE RESIN COATING

Masao Kubo, Koshigaya; Tetsuo Miyake, Saitama; Kunimitsu Matsuzaki, Yono, and Katsuji Kitagawa, Kasukabe, all of Japan, assignors to Somar Corporation, Japan

Filed Nov. 7, 1990, Ser. No. 611,759

Claims priority, application Japan, Nov. 10, 1989, 1-293105

Int. Cl.[5] B21B *45/00*

U.S. Cl. 72—46 **5 Claims**

1. A method of processing a metal body to produce a bent, metal body having a hardened resin coating on at least the bent surface, comprising the steps of:

(a) providing a powder coating composition providing a flexible, hardenable coating;

(b) coating a surface of the metal body with the powder coating composition by preheating the metal body to a temperature sufficient to melt the coating composition while preventing the coating composition from hardening, and contacting the metal body at said temperature with a fluidized mass of the powder coating composition to form a flexible, hardenable layer over the surface of the metal body;

(d) then bending the metal body at a portion having the hardenable layer; and

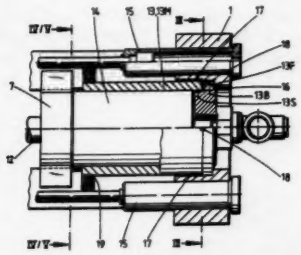
(e) then hardening the hardenable layer.

5,062,285

HORIZONTAL METAL EXTRUSION PRESS

Horst Groos, Birkenweg 6, D-4020 Mettmann 2, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 606,099
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937276
Int. Cl.[5] B21C *23/04, 26/00*
U.S. Cl. 72—272 13 Claims



1. In a horizontal metal extrusion press including a cylinder crosshead; a counter cross head for supporting a press die; tie rods interconnecting said crossroads to form a press frame; a receiver container mounted in axially slidably displaceable manner on said press frame; a traveling crosshead mounted in axially slidably displaceable manner on said press frame; a press ram carried by said travelling crosshead for extruding a billet; a press cylinder axially secured to said cylinder crosshead; and a press piston axially slideably disposed in said press cylinder for axially displacing said travelling crosshead; said press cylinder being a tubular open-ended sleeve and a cylinder head closing one open end of the sleeve proximate said cylinder crosshead; the improvement comprising:

a plug region on said cylinder head located within said one open end of said sleeve;

a flange region on said cylinder head facing an end surface of said sleeve at said one open end, so that said end surface and flange region have mutually opposed radially extending surfaces; and

a plurality of radially extending mechanical key means interconnecting said opposed surfaces for positively centering said cylinder sleeve with respect to said cylinder head.

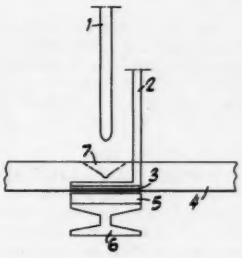
5,062,286

METHOD AND APPARATUS FOR BENDING CORRUGATED SHEET

Bengt I. G. Sjöblom, Norrtälje, Sweden, assignor to Beco Produktutveckling, Norrtalje, Sweden

PCT No. PCT/SE88/00566, § 371 Date May 10, 1990, § 102(e) Date May 10, 1990, PCT Pub. No. WO89/04222, PCT Pub. Date May 18, 1989
PCT Filed Oct. 25, 1988, Ser. No. 487,959
Claims priority, application Sweden, Nov. 3, 1987, 8704304
Int. Cl.[5] B21D *11/20*
U.S. Cl. 72—305 9 Claims

1. A method for bending corrugulated sheet transversely of its corrugations in two stages; said method comprising in the first stage, placing the corrugated sheet on a flat support, holding the corrugated sheet in position on the support by a tongued pressfoot having tongues brought into pressure engagement with the bottom of valleys of the corrugated sheet, moving a bar towards the flat support to form indentations in the crests of the corrugations and produce a fold line or weakening in the corrugated sheet transversely of the longitudinal axes of said corrugations; and in the second of said stages,



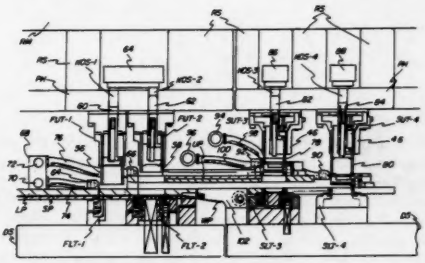
bending the sheet over a support edge along the fold line or weakening to an angle determined by said indentation.

5,062,287

METHOD AND APPARATUS FOR MAKING AND TRANSFERRING SHELLS FOR CANS

Omar L. Brown, Dayton, and David K. Wynn, Tipp City, both of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Filed Jan. 19, 1990, Ser. No. 467,818
Int. Cl.[5] B21D *43/18*
U.S. Cl. 72—336 29 Claims



1. A method of forming within a press a plurality of shells such as used in the manufacture of can ends, comprising the steps of:

at a first station providing a plurality of first sets of tooling arranged in first and second parallel rows; at a second station providing a plurality of second sets of tooling arranged in third and fourth parallel rows;

at each of said first tooling sets, separating a generally circular blank from a sheet of thin metal and forming into said blank a substantially flat central panel and an upward extending chuckwall about the edge of said panel to produce a partially formed shell;

at each of said tooling sets of said first row, lifting the partially formed shell therein to a first level above said metal sheet;

transferring from each of said first tooling sets of said first row the partially formed shell along a substantially horizontal lower path at said first level to one of said second tooling sets of said fourth row by applying a force edgewise of the shell and thereby directing said shell edgewise to said second station;

at each of said tooling sets of said second row, lifting the partially formed shell therein to a second level higher than said first level;

transferring from each of said first tooling sets of said second row the partially formed shell along a substantially horizontal upper path at said second level to one of said sec-

ond tooling sets of said third row by applying a force edgewise of the shell and thereby directing said shell edgewise to said second station;

capturing and locating the partially formed shells within said second tooling sets;

at each of said second tooling sets forming into the shell located therein a countersink at the base of said chuckwall by moving said panel upward relative to said chuckwall to produce a completed shell; and

discharging the completed shells from said second station.

5,062,288

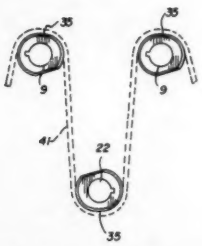
METHOD AND APPARATUS FOR FORMING BENDS IN A TUBE

Keith Titzer, Evansville; Charlie Oran, Wadesville; Richard Reich, Evansville; Gary Gann, Evansville; William O. Toy, Jr., Evansville; Jerry Lamb, Evansville; Chris Brack, Evansville; Lloyd Comer, Evansville; Dan Libbert, Evansville; Don Masterson, Evansville; Jerry Shekell, Evansville; Don Deig, Evansville; Kenneth Butler, Evansville, and Earl Roehm, Evansville, all of Ind., assignors to Indiana Tube Corporation, Evansville, Ind.

Filed Dec. 13, 1990, Ser. No. 625,655

Int. Cl.[5] B21D *11/07*

U.S. Cl. 72—383 **7 Claims**



1. A method for forming a tube into a serpentine configuration comprising the steps of locating at least one straight tube lengthwise between spaced bend forming elements having predetermined curvatures thereon with adjacent bend forming elements being disposed on opposite sides of the tube, clamping the ends of the tube, bringing the spaced bend forming elements together with lazy tong linkages along a longitudinal line parallel to the longitudinal center line of the straight tube and simultaneously drawing one set of alternate bend forming elements disposed on one side of the straight tube along a line extending normally with respect to the longitudinal center line of the straight tube to form the tube into a serpentine configuration, and subsequently separating the tube forming elements and changing the curvature on the bend forming elements and bringing the bend forming elements together again to reshape the bends formed in the tube.

5,062,289

BENDING TOOLING FOR BENDING FLAT BLANKS

Johannes C. W. Bakermans, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

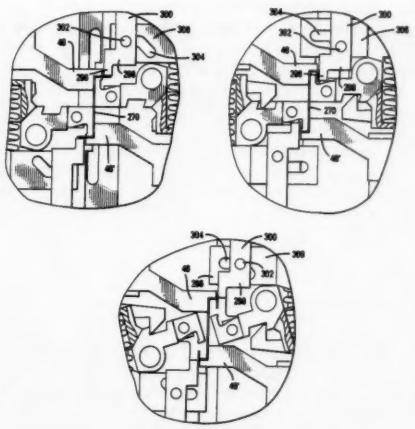
Filed Jun. 1, 1990, Ser. No. 532,298

Int. Cl.[5] B21D *5/01*

U.S. Cl. 72—383 **39 Claims**

1. Apparatus for carrying out forming operations on first and second flat blanks, the blanks being integral with, and extending from, first and second side edges of a continuous carrier strip which has a plurality of identical flat blanks extending from the first and second side edges, the carrier strip having a center line which is between the first and second side edges, each blank having an adjacent portion which is adjacent to the carrier strip, a blank free end which is spaced from the carrier strip, and a remote portion which is between the adjacent portion and the blank free end, the remote portion of each blank, after the forming operation has been carried out, being bent laterally of the adjacent portion and extending normally of the plane of the carrier strip, the apparatus having an operating zone and strip feeding means for intermittently feeding the strip along a strip feed path which extends through the operating zone, the apparatus comprising:

first and second ram assemblies which are movable towards and away from each other between retracted positions and closed positions, the ram assemblies having opposed faces which are spaced apart when the ram assemblies are in their retracted positions and are substantially against each other when the ram assemblies are in their closed positions, the ram assemblies being on opposite sides of the strip feed path, the strip feed path being in a plane which



is perpendicular to the directions of movement of the ram assemblies,

the first ram assembly having a first mandrel thereon which has a first mandrel end, the first mandrel being against, and in alignment with, the first blank when the ram assemblies are in their closed positions with the first mandrel end located between the blank free end and the adjacent portion of the first blank,

the second ram assembly having first primary bending tooling means thereon which is engageable with the remote portion of the first blank when the second ram assembly moves to its closed position thereby to bend the remote portion of the first blank laterally of the plane of the

carrier strip over the first mandrel end through an angle of substantially 90 degrees;

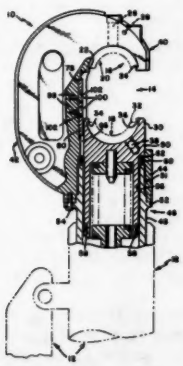
the second ram assembly has a second mandrel thereon and the first ram assembly has a second primary bending tooling means thereon, the first mandrel and the first primary bending tooling means being on one side of the center line of the carrier strip, the second mandrel and the second primary bending tooling means being on the other side of the center line of the carrier strip whereby, upon movement of the ram assemblies towards each other from their retracted positions to their closed positions, the remote portion of the first blank is bent laterally of the plane of the strip in a first direction and the remote portion of the second blank is bent laterally of the plane of the strip in a second direction so that the formed laterally extending remote portion of the first blank is on one side of the plane of the carrier strip and the formed laterally extending remote portion of the second blank is on the other side of the plane of the carrier strip.

5,062,290

HYDRAULIC CRIMPING PRESS FOR ELECTRICAL CONNECTORS

John B. Hoover, Manchester, N.H., assignor to Burndy Corporation, Norwalk, Conn.

Filed Jun. 25, 1990, Ser. No. 544,264
Int. Cl.[5] B21D *41/04*; B23P *11/00*
U.S. Cl. 72—416 **1 Claim**



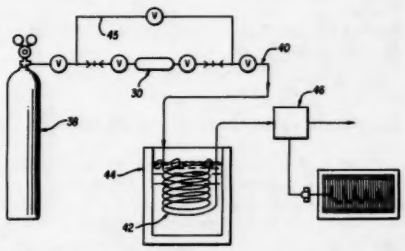
1. A hydraulic tool for crimping connectors comprising a C-shaped die head having a spine, a lower hub, and an upper jaw, a die fitted into the upper jaw defining a fixed die, a piston ram and cylinder subassembly secured to and together with the hub member aligned along the vertical tool axis, the piston ram having an upper side wall and an upper surface defining a low jaw, a die member fitted to the movable jaw defining a movable die, the fixed and movable dies aligned along the tool axis and cooperating to crimp connectors when the tool is actuated, the piston ram upper wall having a dovetail channel defined by a channel base and converging side walls extending vertically along the surface of the upper wall from its base to the circumferential surface of the upper wall, the channel being open at the top, side and bottom portions of the side wall, a recess in the spine portion of the C-shaped head extending vertically in parallel with the tool axis and in confronting relation with the dovetail channel and for a sufficient length to accommodate the excursionary distance travelled by the piston ram during a crimping operation, the recess having a base portion and parallel side walls, a dovetail key in the recess having a base portion conforming to the recess, side walls flaring outward from the base portion and conforming to the contour of the dovetail channel so that the circumferential surface and the coverging side walls of the channel form wall members for grasping the dovetail key whereby the piston ram is guided during the crimping operation by the dovetail key to move in a true axial direction being held in true axial alignment when encountering non-linear forces as when crimping an irregular shaped connector and for preventing the piston ram from rotating with respect to the tool axis or from moving laterally of the tool axis so that opposing die members maintain planar alignment for proper engagement and crimping of irregular shaped connectors.

5,062,291

CALIBRATION OF FLOWMETERS USING A DISSOLVED ARGON TRACER TECHNIQUE

Roger H. Asay, Santa Clara, Calif., assignor to Radiological & Chemical Technology, Inc., San Jose, Calif.

Filed Apr. 3, 1989, Ser. No. 332,619
Int. Cl.[5] G01F *25/00*
U.S. Cl. 73—3 **43 Claims**



1. A method of calibrating a flowmeter in a system having a condensible fluid flowing in a flowpath therein, comprising:

injecting a known volume of a liquid test solution into said flowpath upstream of said flowmeter, said solution having dissolved therein a known concentration of an inert gas not otherwise present in said fluid;

observing the indicated flowrate indicated by said flowmeter;

measuring the concentration of said inert gas present in a condensed form of said fluid at a position in said flowpath downstream of said flowmeter; and

determining the true flowrate corresponding to the indicated flowrate.

5,062,292

DEVICE FOR MEASURING GAS DISSOLVED IN OIL

Masaru Kanba; Yasuo Inoue; Sadayoshi Mukai; Masanari Kikkawa, and Yasunori Suga, all of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 231,296, Aug. 12, 1988, abandoned.
This application May 8, 1990, Ser. No. 520,842
Claims priority, application Japan, Aug. 12, 1987, 62-123564[U]; Aug. 17, 1987, 62-125089[U]; Dec. 25, 1987, 62-198513[U]; Dec. 29, 1987, 62-198878[U]; Feb. 12, 1988, 63-18026[U]; Apr. 18, 1988, 63-51682[U]
Int. Cl.[5] G01N *7/00*
U.S. Cl. 73—19.01 **20 Claims**

1. A device for measuring a gas dissolved in an oil sample, comprising:

a sample container for containing an oil sample;

an air bubble discharging means, provided in said sample container, for extracting a measurement gas dissolved in said oil sample;

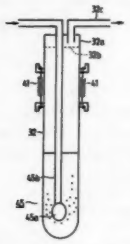
a gas container for containing said measurement gas extracted by said air bubble discharging means;

gas detecting means for detecting said measurement gas charged in said gas container;

measuring means for measuring a concentration of said measurement gas in response to a signal dispatched from said gas detecting means;

pumping means for supplying air to said air bubble discharging means; and

filter means for purifying the air before being fed into said air bubble dischrging means;



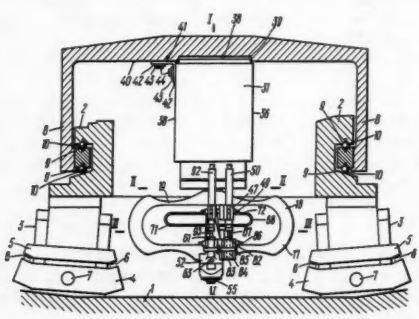
said air bubble discharging means comprising a mesh filter having a mesh of 0.5 to 10 μm square for discharging bubbles therefrom and air leading means for leading air to said discharging means.

5,062,293

APPARATUS FOR MEASURING HARDNESS OF MATERIALS

Murat B. Bakirov, Zhukovsky; Alexandr F. Getman, Moscow; Boris I. Gribov, Sofrino; Andrei A. Bordjugovsky, and Alexandra P. Klimenok, both of Moscow, all of U.S.S.R., assignors to Nauchno-Proizvodstvennoe Objedinenie, Moscow, U.S.S.R.

Filed Jan. 8, 1990, Ser. No. 461,749
Int. Cl.[5] G01N *3/42*
U.S. Cl. 73—81 **39 Claims**



1. An apparatus for measuring hardness of materials, said apparatus comprising:

a rod having an axis; a center plate of said rod having a first end and a second end; a shank of said rod having a first end and a second end; said first end of said shank being secured to said first end of said center plate of said rod;

an indentor to be pressed into a surface of material secured to the second end of said center plate of the rod;

a dynamometric gauge having a first branch and a second branch, a longitudinal plane of symmetry which is positioned to extend perpendicularly with respect to said surface of material; the first branch of said dynamometric gauge having an outer surface and an inner surface and a hole in which said shank of said rod is received; the second branch of said dynamometric gauge having an outer surface and an inner surface;

a means for loading the indentor accommodated in a casing; a spindle of said means for loading the indentor having a periphery and mounted coaxially with said rod on said second branch of said dynamometric gauge; a drive for moving the spindle of said means for loading the indentor which is mechanically coupled to said spindle of said means for loading the indentor;

at least one pick-up for measuring the load at the indentor having a body and a sensor member, the body being mechanically coupled to one of the branches of said dynamometric gauge; said sensor member of said at least one pick-up for measuring the load at the indentor being engageable with said other branch of said dynamometric gauge;

a means for measuring the depth of penetration of the indentor into the surface of material in the form of a frame having a first bar and a second bar opposed to each other, a longitudinal plane of symmetry, said first and second bars enclosing said first branch of said dynamometric gauge; said first bar of said frame of said means for measuring the depth of penetration of the indentor into the surface of material having a central part and a peripheral part, being positioned between said surface of material and said first branch of said dynamometric gauge and mounted for movement along said axis of said rod on said center plate of said rod; said second bar of said frame of said means for measuring the depth of penetration of the indentor into the surface of material having a central portion and a peripheral portion, being positioned between said first and second branches of said dynamometric gauge and mounted for movement along said axis of said rod on said shank of said rod; a tip having a first end and a second end and an interior space, the first end of the tip being secured to said first bar of said frame and the second end of tip being engageable with said surface of material; said interior space of said tip receiving the indentor in spaced relation thereto;

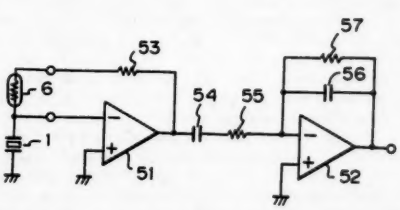
at least one pick-up for measuring the depth of penetration of the indentor into the surface of material having a body and a sensor member, the body being mechanically coupled to said first branch of said dynamometric gauge, the sensor member being engageable with said frame of said means for measuring the depth of penetration of the indentor into the surface of material.

5,062,294

APPARATUS FOR DETECTING PRESSURE IN CYLINDER OF INTERNAL COMBUSTION ENGINE

Toshio Iwata, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Continuation of Ser. No. 311,787, Feb. 17, 1989, abandoned.
This application Mar. 29, 1990, Ser. No. 503,072
Claims priority, application Japan, Feb. 22, 1988, 63-39906; Feb. 22, 1988, 63-39907; Feb. 22, 1988, 63-39909; Feb. 22, 1988, 63-39910; Mar. 18, 1988, 63-35162[U]
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—115 **9 Claims**



1. An apparatus for detecting pressure in a cylinder of an internal combustion engine, comprising:

a piezoelectric pressure sensor for detecting pressure in the combustion cylinder of said internal combustion engine and for outputting an electrical output signal according to the pressure;

a current input circuit for directly receiving said electrical signal output from said sensor in the form of a current and

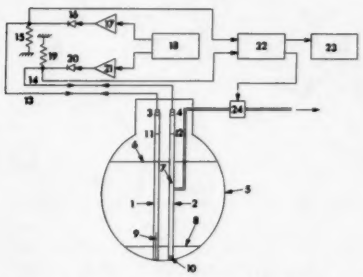
for generating an output corresponding to the value of the current, wherein said current input circuit consists of an operational amplifier and resistory means connected between input and output terminals of said operational amplifier for converting said current signal output from said sensor to a voltage signal; and wherein said current input circuit outputs said voltage signal which is proportional to dP/dt, where P is said detected pressure.

5,062,295

DUAL TUBE SONIC LEVEL GAGE

Parthasarathy Shakkottai, Duarte, and Eug Y. Kwack, Walnut, both of Calif., assignors to Sparktech, Duarte, Calif.

Filed Dec. 24, 1990, Ser. No. 633,130
Int. Cl.[5] G01F *23/28;* G01H *5/00*
U.S. Cl. 73—290 V 11 Claims



1. A system for measuring the levels of two immiscible liquids such as water and gasoline contained in a tank, comprising two vertical tubular sonic wave guides, resting at the bottom of said tank; one of said wave guides allowing water and gasoline to enter through a long vertical slit thus allowing said gasoline to have the same free surface level inside said guide as outside in said tank; the extent of said slit being from the bottom to the maximum expected level of said lower liquid; the other said waveguide allowing only the heavier liquid to rise by virtue of its being open only at the very bottom; each said guide containing a reflecting stub or ring to produce a reference length from the top to location of said stub or ring; a transmitting and receiving means in each said waveguide for generating sound pulses and detecting said sound pulses multiply-reflected from said stub or ring and from free surfaces of said liquid levels in each said wave guide; means for exciting said transmitting means and measuring time intervals between various pulses, said time intervals being proportional to corresponding distances from said transmitting means; output means for calculating, displaying and tabulating levels and volumes of said liquids and providing control signals to actuate a drain pump to remove water when its level exceeds a preset value in said other waveguide.

5,062,296

RESONANT ULTRASOUND SPECTROSCOPY

Albert Migliori, Santa Fe, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

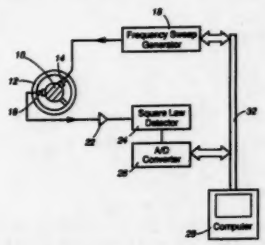
Filed Sep. 20, 1990, Ser. No. 585,557
Int. Cl.[5] G01N *29/12*
U.S. Cl. 73—579 6 Claims

1. A method for characterizing an object by resonant ultrasound spectroscopy, comprising the steps of:

applying to said object acoustic waves having frequencies swept over a predetermined frequency range;

detecting a response of said object to said acoustic waves;

determining the frequency of each resonant response peak in said predetermined frequency range; and



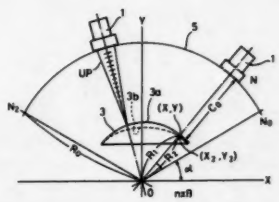
forming a unique signature of said object from a density distribution of said resonant response frequencies.

5,062,297

METHOD OF MEASURING A PROFILE OF AN OBJECT AND AN APPARATUS FOR CARRYING OUT THE METHOD

Nobuo Hashimoto, Tokyo; Kunioki Suzuki, Shizuoka, and Teruaki Saijo, Shiga, all of Japan, assignors to 501 Toray Industries, Inc., Tokyo, Japan

Filed Jul. 12, 1989, Ser. No. 378,991
Claims priority, application Japan, Aug. 16, 1988, 63-203362; Aug. 16, 1988, 63-203363
Int. Cl.[5] G01N *9/24*
U.S. Cl. 73—597 15 Claims



1. A method of measuring a profile of an object located in a predetermined position under water, comprising the steps of:

moving an ultrasonic transducer sequentially to a plurality of measurement points on an arc equidistant from a predetermined rotational center while opposing said ultrasonic transducer to the object;

radiating an ultrasonic wave from said ultrasonic transducer toward said predetermined rotational center when said ultrasonic transducer is in each of said measurement points on said arc;

receiving a reflected wave which has been radiated from said ultrasonic transducer and reflected at a surface of said object, by said ultrasonic transducer;

calculating a distance between said ultrasonic transducer and the surface of said object in accordance with a difference between the time said ultrasonic transducer radiated the ultrasonic wave and the time said ultrasonic transducer received the reflected wave reflected at the surface of said object;

calculating coordinates on the surface of said object from coordinates of each of said measurement points and the calculated distance corresponding thereto; and

obtaining a profile of said object from the calculated coordinates of the surface thereof in each said measurement point;

said ultrasonic transducer being swung about a center of the ultrasonic radiation surface thereof at each of said measurement points while an intensity of the reflected wave at the surface of said object is measured, to detect an angle of swing where the intensity of the reflected wave is maxi-

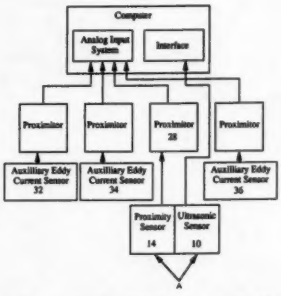
mum, and said coordinates of the surface of said object are obtained from the detected angle of swing, in addition to the coordinates of each of said measurement points and the calculated distance corresponding to each of said measurement points.

5,062,298

NON-CONTACT WET OR DRY FILM THICKNESS MEASURING DEVICE USING EDDY CURRENT AND ULTRASONIC SENSORS

Allan F. Falcoff, Lake Orion, and Norman M. West, Pontiac, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1989, Ser. No. 446,336
Int. Cl.[5] G01B *7/10*
U.S. Cl. 73—597 **6 Claims**



1. A device for measuring the thickness of a film applied on a substrate without contacting the film, comprising;

a) first ultrasonic sensor means for measuring a first distance value between the top surface of the film and the device; wherein the ultrasonic sensor means comprises an ultrasonic pulse generator which generates an ultrasonic pulse which is directed to the film surface and a transducer which receives the pulse after it is reflected back from the film surface;

b) second electrical proximity sensor means immediately adjacent with said first means for measuring a second distance value between the top surface of the substrate and the device; wherein the electrical proximity sensor means comprises an inductive eddy-current proximity sensor means;

c) said first and second means disposed on the same side of the substrate;

d) means operabiy associated with said first and second means for calculating the film thickness by comparing said first and second distance values;

e) auxiliary sensor means comprising inductive eddy-current sensors means spaced from said second electrical proximity sensor means for measuring a third distance value between the top surface of the substrate and the device;

f) said first ultrasonic sensor means, said second electrical proximity sensor means and said auxiliary sensor means all disposed on the same side of the substrate; and

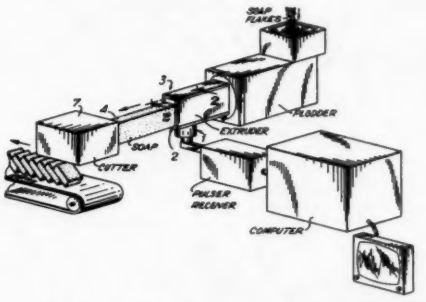
g) means being operably associated with said first ultrasonic sensor means, said second electrical proximity sensor means and said auxiliary sensor proximity sensor means and said auxiliary sensor means for calculating the film thickness by comparing said first, second, and third distance values.

5,062,299

APPARATUS AND METHOD FOR DETECTING INHOMOGENEITIES IN SEMI-PLASTIC SUBSTANCES THROUGH ULTRASOUND

Ray E. Davis; Dana L. Duncan, both of Old Lyme; Samir W. Habboosh, Norwich; James R. Hall, Clinton; Dennis L. Nudelman, Waterford, and Michael J. Westkamper, Salem, all of Conn., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Jan. 5, 1990, Ser. No. 461,200
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—609 **32 Claims**



1. A method for detecting inhomogeneities in a semi-plastic substance through steps comprising:

(a) extruding a flow of said substance through and orifice;

(b) generating an ultrasonic wave and emitting said wave outwardly through an ultrasonic probe, said probe including an ultrasound delay material at one end thereof, said delay material being a thermoplastic in solid form, and said probe being positioned at said orifice;

(c) contacting said delay material against a face of said substance as said substance exits said orifice, said substance as it flows downstream past said delay material being wedged inwardly at an angle to achieve good contact between said substance and said material;

(d) directing said wave from said probe through said delay material and then through said flow;

(e) receiving a signal based on a return of said wave passing through said flow; and

(f) analyzing said signal by means of a program comparing said signal to a reference value.

5,062,300

DEVICE FOR THE ULTRASONIC NON-DESTRUCTIVE TESTING OF TUBES

Jean P. Vallee, 4, rue de la Fontaine, 78820 Juziers, France

Filed Dec. 9, 1988, Ser. No. 281,715
Claims priority, application France, Nov. 25, 1987, 87 16353
Int. Cl.[5] G01N *29/06, 29/26*
U.S. Cl. 73—623 **5 Claims**

1. Ultrasonic device for non-destructive testing of tubes having a thickness which is small as compared with their diameter, comprising a head having a longitudinal axis and insertable into a tube along said longitudinal axis means for centering the head in a tube and means for imparting to the head a rectilinear motion along said longitudinal axis and a rotational motion about said axis,

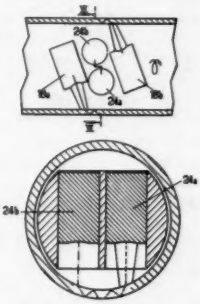
said head containing ultrasonic transducer means arranged to be coupled with a wall of a tube into which said head is introduced through a fluid and able to transmit an ultrasonic beam in a direction at an angle with said longitudinal axis and to detect echoes of said beam,

wherein said transducer means comprise

two first ultrasonic transducers located symmetrically with respect to a plane perpendicular to said axis and delivering

a focussed base directed in a plane containing said longitudinal axis and at an angle with a direction perpendicular to the longitudinal axis, and

two second ultrasonic transducers located symmetrically with respect to a plane perpendicular to said longitudinal



axis and each delivering a focussed beam directed parallel to a line perpendicular to said longitudinal axis and located at a distance from said line whereby the beam is oblique with respect to the wall of a tube into which said head is introduced.

5,062,301

SCANNING DEVICE FOR ULTRASONIC QUALITY CONTROL OF ARTICLES

Nikolai P. Aleshin, 15 Parkovaya ulitsa, 18, korpus 1, kv. 109; Vladimir J. Baranov, Schelkovskoe shosse, 58, Korpus 2, kv. 17, both of Moscow; Vyacheslav M. Dolgov, Scherbinka, ulitsa Pushkinskaya, 6, kv. 18, Moskovskaya oblast; Alexandr A. Yarovoi, prospekt Mira, 25, kv. 48, Nikolaev, and Oleg A. Preobrazhensky, ulitsa Muranovskaya, 13b, kv. 183, Moscow, all of U.S.S.R.

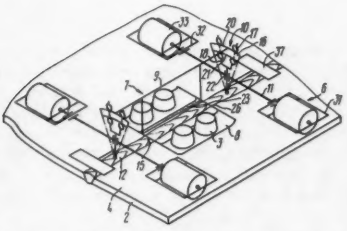
PCT No. PCT/SU88/00048, § 371 Date Jun. 19, 1989, § 102(e) Date Jun. 19, 1989, PCT Pub. No. WO89/05451, PCT Pub. Date Jun. 15, 1989

PCT Filed Feb. 29, 1988, Ser. No. 381,395

Claims priority, application U.S.S.R., Dec. 10, 1987, 4336106

Int. Cl.[5] G01N *29/24, 29/26*

U.S. Cl. 73—629 **12 Claims**



1. A scanning device for ultrasonic quality control of articles, comprising:

a motion mechanism of said scanning device for moving said device along a direction of travel;

ultrasonic transducers adapted to be positioned on an article under inspection;

a suspension assembly for mounting said ultrasonic transducers on said motion mechanism, said assembly establishing an operative connection between ultrasonic transducers and said motion mechanism, said assembly including,

flexible members positioned above the surface of said article under inspection along the direction of the travel of said device, preset with said motion mechanism,

said flexible members having said ultrasonic transducers fixedly mounted thereon,

a beam having a first end and a second end, extending above said flexible members along said direction of the travel of said device, mechanically connected with said flexible members,

at least two self-aligning supports having a common rolling axis extending in direct proximity to said surface of said article under inspection,

each said self-aligning support including,

a first part carried by said beam, and

a second part arranged with respect to said first part so that relative displacement of said two parts takes place about said rolling axis common to said self-aligning supports, and

two rockers operatively connected with said beam and said motion mechanism;

means for holding said ultrasonic transducers against said surface of said article under inspection.

5,062,302

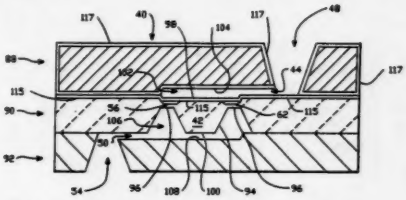
LAMINATED SEMICONDUCTOR SENSOR WITH OVERPRESSURE PROTECTION

Kurt E. Petersen, San Jose; Phillip W. Barth, Palo Alto; Janusz Bryzek, and Joseph R. Mallon, Jr., both of Fremont, all of Calif., assignors to Schlumberger Industries, Inc., Norcross, Ga.

Continuation of Ser. No. 187,739, Apr. 29, 1988, abandoned. This application Aug. 27, 1990, Ser. No. 574,387

Int. Cl.[5] G01L *9/00*

U.S. Cl. 73—754 **23 Claims**



1. An electromechanical sensor comprising:

a first semiconductor wafer including a first stop surface residing in a first shallow recessed region of said first wafer;

a second semiconductor wafer;

wherein said first and second semiconductor wafers are laminated together such that said first recessed region of said first wafer and said second wafer define a first chamber in which said first stop surface and said second wafer are disposed close enough together such that said first stop surface restrains said second wafer from deflecting beyond said first stop surface;

means for measuring deflection of said second wafer;

wherein said second wafer includes a first contact surface residing in a second shallow recessed region of said second wafer;

wherein said first stop surface and said first contact surface are disposed substantially opposite each other in said first chamber; and

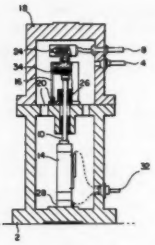
wherein said second shallow recessed region includes a center section and a thinner perimeter section which substantially surrounds said center section.

5,062,303

ENCAPSULATED ACTUATOR FOR TESTING OF SPECIMENS

Larry D. Gould, Canaan, and David M. Cole, Lyme, both of N.H., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 22, 1990, Ser. No. 542,331
Int. Cl.[5] G01N *3/00*
U.S. Cl. 73—798 16 Claims



1. Apparatus for applying a mechanical stress to a specimen, comprising

(a) a housing containing a wall defining first and second chambers, the specimen being arranged in said first chamber and the walls containing a plurality of vent holes to equalize the hydrostatic pressure within said first and second chambers;

(b) actuator means arranged within said second chamber for generating a mechanical force;

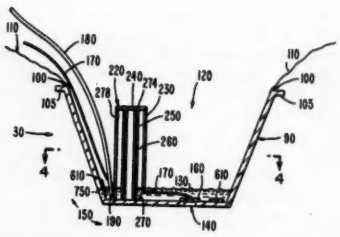
(c) force transmitting means connected between said actuator means and the specimen, said force transmitting means passing through an opening in said housing wall to transmit the mechanical force from said actuator means to the specimen, whereby said actuator is encapsulated within said second chamber and subjected to the same confining pressure as the specimen.

5,062,304

URINE COLLECTION MONITOR WITH TEMPERATURE SENSING

Robert S. Van Buskirk, Danville, and Robert R. Clappier, Los Altos, both of Calif., assignors to Endotherapeutics, Menlo Park, Calif.

Filed May 12, 1989, Ser. No. 351,733
Int. Cl.[5] G01F *1/00*
U.S. Cl. 73—861 24 Claims



1. An apparatus for measuring temperatures and flow rates of a fluid, comprising:

a vessel including a wall defining an interior and an exterior, said interior for collecting an amount of the fluid;

a first electrode comprising a first electrical conductor disposed adjacent said wall at said exterior;

a second electrode carried in said interior of said vessel;

a first dielectric disposed adjacent said first electrode for insulating said first electrode from said second electrode and from said fluid;

a second dielectric disposed adjacent said second electrode and in communication with said vessel interior, such that said first and second electrodes and said first and second dielectrics together comprise a variable capacitor with a capacitance value which varies with said amount of fluid;

means connected to said variable capacitor for determining the flow rates of the fluid as a function of said capacitance value and for providing an output reflecting said flow rates;

means for displaying said flow rates;

means in communication with said interior for removing a sample of the fluid from said vessel;

means in communication with said interior for draining the fluid from said vessel; and

means for sensing temperatures of the fluid within the vessel; and

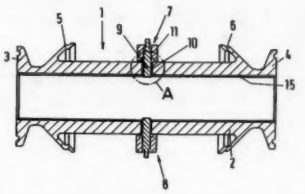
means for correlating said sensed temperatures with said flow rates.

5,062,305

METHOD OF MAKING A MEASURING TUBE FOR AN ELECTROMAGNETIC FLOW METER, AND THE MEASURING TUBE

Henry Hansen, Grasten; Leif Studsgaard, Augustenborg, and Erik Laursen, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed May 29, 1990, Ser. No. 530,907
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3917975
Int. Cl.[5] G01F *1/58*
U.S. Cl. 73—861.12 16 Claims



1. A method of making a measuring tube for an electromagnetic flow meter wherein the measuring tube has a tube member made of a non-magnetic material such as stainless steel and having an inner circumferential surface and spaced through passages defined by surfaces opening through the tube member inner circumferential surface into the tube member interior, and a continuous lining of meltable electrically non-conductive material covering the inner circumferential surface and the through passages, the steps of

(a) fixing electrodes to extend through the through passages and radially into the tube member interior in spaced relationship to the through passage surfaces to provide gaps between the electrodes and the passage surfaces and with the electrode end faces located in the tube member interior,

(b) applying enamel priming slip to circumferential surface and in the entire gaps,

(c) then clearing the enamel priming slip from the electrode end faces, and

(d) thereafter heating the enamel priming slip to melt the enamel priming slip and thence cooling the heated priming slip.

5,062,306

APPARATUS FOR DETECTING TORQUE OF ROTATING SHAFT

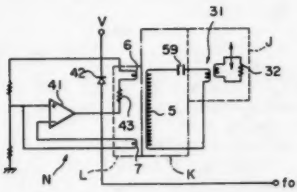
Shigeyuki Gotoh; Kazunori Yokota, and Isao Suzuki, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Apr. 17, 1990, Ser. No. 510,005

Claims priority, application Japan, Apr. 20, 1989, 1-101157; Apr. 24, 1989, 1-104128

Int. Cl.[5] G01L 3/10

U.S. Cl. 73—862.33 19 Claims



1. A torque detecting apparatus for detecting torque applied to a rotatable shaft, comprising:

an annular bobbinless sensor coil disposed rotatably with the shaft and formed by winding an electrically conductive wire so as to define a hollow space;

a position-adjustable, non-ferromagnetic metal core member disposed rotatably with the shaft at a position adjacent said sensor coil, said core member being associated with said sensor coil so that when a relative angular displacement develops between said core member and said sensor coil upon twisting of the shaft in response to application of torque thereto, said core member is moved within the hollow space of said sensor coil to thereby change inductance of said sensor coil in corespondence to the relative angular displacement;

a capacitor mounted on the shaft;

solenoid coil means wound on said shaft and connected to said capacitor and said sensor coil to thereby constitute a resonance circuit; and

detecting means including one set of an input coil and an ouput coil each comprising a magnetic core and an electrically conductive wire wound around said magnetic core, said input and output coils of said detecting means being disposed opposite said solenoid coil means in radially outwardly spaced relation with the outer periphery of the shaft, said detecting means forming, in cooperation with said resonance circuit, an oscillation circuit capable of oscillating at the resonant frequency of said resonance circuit for detecting the angular displacement corresponding to the torque in terms of change in the oscillation frequency.

5,062,307

STRAIN DETECTOR

Hideo Ikeda; Chiyo Hamamura; Hiroshi Satoh, and Yoshihiko Utsui, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

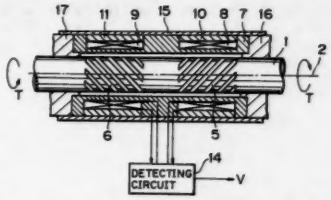
Filed Apr. 26, 1990, Ser. No. 514,801

Claims priority, application Japan, Apr. 27, 1989, 1-109713; Apr. 27, 1989, 1-109715; May 17, 1989, 1-123311; May 17, 1989, 1-123312

Int. Cl.[5] G01L 3/10

U.S. Cl. 73—862.36 4 Claims

1. A strain detector for detecting strain in a driven shaft to which an external force is applied, comprising a magnetic layer made of a soft magnetic material having a high permeability and suitable magnetostriction fixedly mounted on an outer periphery of said driven shaft, a pair of bearings or bearing stands made of a soft magnetic material having a high permeability for supporting said driven shaft for rotation thereon, a detecting coil disposed around said magnetic layer for detecting a variation of the permeability of said magnetic layer arising from strain of said magnetic layer caused by an external force applied to said driven shaft, and a shield disposed on an



outer periphery of said detecting coil and magnetically connected at the axial opposite end portions thereof to said bearings or bearing stands.

5,062,308

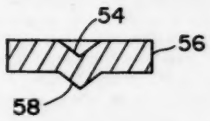
FILTER PUNCH AND FILTER COLLECTION SYSTEM

Donald B. Rising, Stow, and Emile O. Montminy, Lowell, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 169,523, Mar. 17, 1988, Pat. No. 4,974,462. This application Oct. 15, 1990, Ser. No. 583,428

Int. Cl.[5] G01N 1/04

U.S. Cl. 73—864.41 9 Claims



1. A filter punch which comprises a punch section having a thickness and two opposing surfaces,

a filter piercing member secured to and extending from one of said opposing surfaces, said one of said opposing surfaces comprising a flat surface, said filter piercing member having a sharp point and having a side area and a vertical axis, said side area and said vertical axis forming a small angle such that a filter pierced by said piercing member is secured to said piercing member and

a punch guide comprising a depression formed in the second of said opposing surfaces, said punch section, piercing member and guide having a size and shape to permit said filter punch to pass through a filter section having substantially the same size and shape of said one of said opposing surfaces.

5,062,309

DEVICE FOR TAKING SAMPLES OF BOTTOM SEDIMENTS FROM WATER BASINS

Martin A. Voll, and Robert K. Eiskop, both of Tallin, U.S.S.R., assignors to Institut Khimii Akademii Nauk Estonskoi SSR, Tallinn, U.S.S.R.

Continuation-in-part of Ser. No. 404,076, Sep. 7, 1989, abandoned. This application May 25, 1990, Ser. No. 528,343

Int. Cl.[5] G01N 1/04

U.S. Cl. 73—864.44 5 Claims

1. A device for taking samples of bottom sediments from water basins, said device comprising:

at least one vertical coring tube;

sections of said coring tube arranged in succession one after another longitudinally of said tube;

a closed upper end of said tube;

a check valve built in said upper end;

an open lower end of said tube;

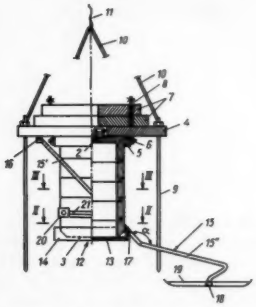
a carrying element, said upper end of said tube being secured to said carrying element;

a forked rod having a branched upper end and an unbranched lower end and the entire length exceeding the entire length of said tube;

said branched upper part of said rod having two branches with upper ends of said rod;

said unbranched lower part of said rod having a lower end of said rod;

said branches of said branched part, pivotally secured by



said upper ends to said carrying element symmetrically relative to said tube and with the distance from each other exceeding the diameter of said tube;

a cover, pivotally secured to said branches at the places guaranteeing that in a rest position said cover closes said lower end of said tube;

said lower end of said rod, being in a rest position below the level of said lower end of said tube;

a plate, pivotally secured to said lower end of said rod.

5,062,310

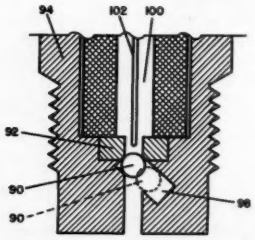
PROBE INLET APPARATUS AND METHOD

David K. Eaton, Austin, Tex., assignor to Jade Systems, Inc., Austin, Tex.

Filed Mar. 1, 1990, Ser. No. 487,599

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—866.5 **21 Claims**



1. A probe inlet apparatus for facilitating the introduction of an elongated probe member into an isolated environment, the inlet apparatus comprising:

(a) an inlet housing having an inlet housing cavity extending therethrough through which the elongated probe member may pass;

(b) annular seal means connected to the inlet housing for providing an annular seal around the probe member so that fluid may not flow through the inlet housing cavity when the probe member is received through said cavity;

(c) an inner seal seat mounted toward an inner end of the inlet housing from the annular seal means, the inner seal seat having a seat opening through which the probe member may pass when the probe member is extended completely through the inlet housing cavity;

(d) seal member positioning means associated with the inlet housing for providing a magnetic positioning force; and

(e) a seal member responsive to the magnetic positioning force to be positioned in a seated position against the inner seal seat over the seat opening for preventing fluid from flowing through the inlet housing cavity from the seal opening toward the annular seal means, and adapted to be contacted and moved to an unseated position against said magnetic positioning force by the probe member as the probe member is inserted through the seat opening toward the inner end of the inlet housing from the annular seal means.

5,062,311

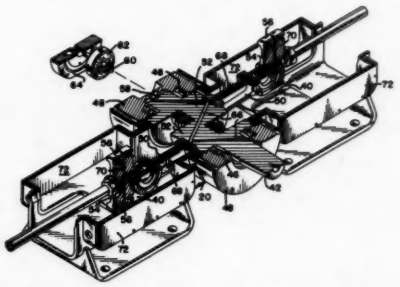
FRAME, CRANKSHAFT AND CROSSHEAD ASSEMBLY, AND A CRANKSHAFT AND CROSSHEAD FRAME, FOR A RECIPROCATING-PISTON MACHINE

Robert A. Bennitt, Painted Post, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Mar. 29, 1991, Ser. No. 677,698

Int. Cl.[5] F16H *21/22*

U.S. Cl. 74—44 **17 Claims**



1. A frame, crankshaft and crosshead assembly for a reciprocating-piston machine, comprising:

a tubular housing; and

means fixed to said housing for supporting said housing along a given, longitudinal axis; wherein

said housing has apertures formed therein; and including

a crankshaft journalled in said apertures; wherein

said housing further has openings formed therein; and including

casings fixed in said openings; and

a crosshead subassembly coupled to said crankshaft; wherein

said casings have webs upon which, slidably, said subassembly is supported.

5,062,312

ACTUATOR

Yoshio Watanuki; Haruo Mochida; Masaru Inoue; Kazuya Suzuki, and Masaki Tanaka, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd. and Jidosha Denki Kogyo K.K., both of Kanagawa, Japan

Filed Dec. 13, 1989, Ser. No. 450,102

Claims priority, application Japan, Dec. 15, 1988, 63-162568[U]

Int. Cl.[5] F16H *29/20;* **F16D** *71/00*

U.S. Cl. 74—89.14 **1 Claim**

1. An actuator comprising:

a motor having a shaft;

a worm connected to said shaft of said motor;

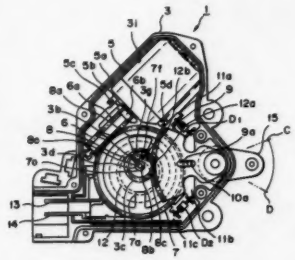
a worm wheel disposed in meshing engagement with said worm and provided with a pinion-engaging part and spring means for biasing the worm wheel to an original starting position;

a pinion provided with a worm wheel-engaging part to be engaged with said pinion-engaging part and having a

rotational axis offset from a rotational axis of said worm wheel;

a sector wheel having an output arm and a holder engaging slot, said sector wheel being disposed in meshing engagement with said pinion;

a contact holder linked to said sector wheel by means of a projection extending through said holder-engaging slot; and



a changeover means for switching contacts on and off according to the position of said contact holder with respect to said sector wheel;

said sector wheel being located at a starting position when said pinion-engaging part is engaged with said worm wheel-engaging part at a position opposite to the rotational axis of said pinion relative to the rotational axis of said worm wheel.

5,062,313

MANUAL CONTROL FOR EXTENDED RANGE SPLITTER TYPE COMPOUND TRANSMISSION

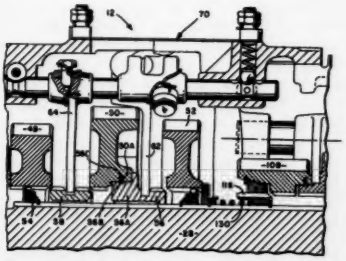
Melvern W. Fletcher, Manchester, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 6, 1990, Ser. No. 475,529

Claims priority, application United Kingdom, Feb. 11, 1989, 8903132.2; May 6, 1989, 8910448.3

Int. Cl.[5] F16H *3/093, 3/16;* F16D *21/04*

U.S. Cl. 74—335 **9 Claims**



2. The control of claim 1 wherein one of said main section mainshaft gears (48) is a second lowest speed ratio main section mainshaft gear and said first main section clutch collar (58) is axially displaceable in a first axial direction from a disengaged position to engage the second lowest speed ratio main section mainshaft gear (48) and in the second axial direction to engage said low speed ratio main section mainshaft gear (50) and said second main section clutch collar (56) is axially displaceable in said first axial direction to cause engagement between said low speed ratio mainsection mainshaft gear (50) and the mainshaft and in the second axial direction to engage a reverse speed mainsection mainshaft gear (52).

5,062,314

SHIFTING ARRANGEMENT FOR A MOTOR VEHICLE TRANSMISSION

Ulrich Maier, Freiberg/N., and Friedrich Raff, Eberdingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

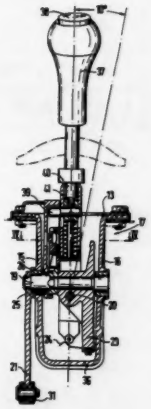
Continuation-in-part of Ser. No. 302,387, Jan. 27, 1989, Pat. No. 4,987,387. This application Aug. 15, 1990, Ser. No. 567,645

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807881; Aug. 24, 1989, 3927922

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.[5] F16H *59/02;* G05G *5/06*

U.S. Cl. 74—475 **10 Claims**



1. A shifting arrangement for an automatic transmission of a motor vehicle controlled by an electronic control unit comprising:

a selector lever pivotable in first and second shifting paths, a pivoting of the selector lever in the first shifting path preselecting driving positions having various transmission gears which are to be automatically shifted, and a pivoting of the selector lever in the second shifting path causing a manual shifting of transmission gears, said second shifting path being parallel to the first shifting path, said selector lever being movable via a transverse path between the first and second shifting paths; and

a hollow frame in which said selector lever is disposed, said hollow frame having a pot-shaped bottom part and a cover part fastened to the bottom part.

5,062,315

DEVICE FOR PREVENTING DISENGAGEMENT OF AN INNER WIRE OF A BOWDEN CABLE FROM A BICYCLE BRAKE OPERATING LEVER

Kenichi Yoshigai, Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Co., Ltd., Osaka, Japan

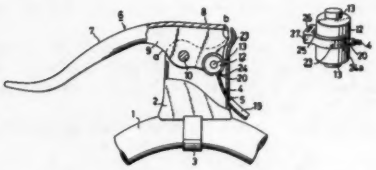
Filed Apr. 20, 1990, Ser. No. 512,103

Int. Cl.[5] F16L *1/10*

U.S. Cl. 74—502.2 **3 Claims**

1. A device for preventing disengagement of an inner wire of a Bowden cable from a bicycle brake operating lever, wherein the Bowden cable has a nipple secured to one end of said inner wire, wherein a connector, in which a locking hole for engaging said nipple is formed, is supported within said operating lever, wherein a ring body is attached upon a circumferential surface of said connector in the area of the locking hole to retain said nipple within the locking hole of said connector,

and wherein said ring body is carried solely by said connector hidden within said operating lever, has a fitting concave por-



tion over a head of the nipple, san has a handle-shaped pickup portion with a slot-shaped through hole for a tool.

5,062,316

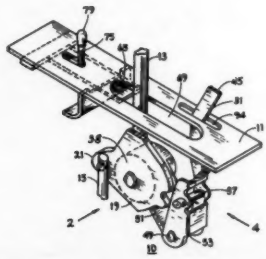
HANDLE POSITION CONTROL APPARATUS

Thomas G. Lykken, and Philip T. Kemper, both of Fargo, N. Dak., assignors to J. I. Case Company, Racine, Wis.

Filed Oct. 19, 1989, Ser. No. 423,843

Int. Cl.[5] G05G *5/06*

U.S. Cl. 74—529 **2 Claims**



1. A handle position control apparatus including:

an operating handle assembly having a plate for coupling such assembly to a hydraulic valve to be positioned, such plate including a detent notch, a shoulder and a control surface, the handle being mounted for movement from a neutral position through an operating position to a float position;

an auxiliary lever mounted for movement between a first, engaged position and a second disengaged position, such lever including an engagement pin for engaging such shoulder when in the first position, thereby preventing such handle from moving to such neutral position while yet permitting movement of the handle to the float position, such auxiliary lever further including a back web and a plurality of side webs attached to the back web, each of such side webs including an aperture for receiving a shaft on which such lever is pivotably moved, each of the side webs further including a hole for receiving such engagement pin, such pin engaging the detent notch, the shoulder or the control surface when such auxiliary lever is in the engaged position;

a force member embodied as a toggling-type compression spring coupled to such lever and acting thereon to maintain such lever in the first position or the second position; and,

a stop plate mounted for movement between an access position for permitting such operating handle to be moved to the float position and a blocking location for preventing such operating handle from being moved to the float position;

such engagement pin preventing such operating handle from moving from the detent position when such engagement pin is in such detent notch.

5,062,317

BRAKING DEVICE FOR AUTOMOTIVE VEHICLE FITTED WITH AN ELECTRIC MOTOR

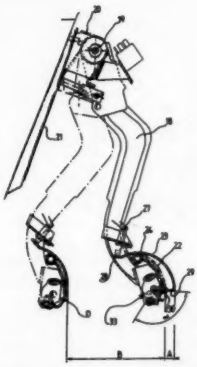
Bernard Saliba, Choisy-le-Roi, France, assignor to Automobiles Peugeot and Automobiles Citroen, both of, France

Filed May 15, 1990, Ser. No. 524,371

Claims priority, application France, May 16, 1989, 89 06376

Int. Cl.[5] G05G *1/14;* H01C *10/00*

U.S. Cl. 74—560 **6 Claims**



1. A brake device for an automotive vehicle including an engine adapted to operate in response to a control signal alternately as an electric motor for driving the vehicle and as a generator for generating electrical energy when said vehicle is moving, an electric power source, means for feeding electric energy from said power source to said engine when said engine is working as a motor and means for transferring electrical energy generated by said engine to said power source when said engine is working as a generator and an electrical device for producing said control signals in accordance with operations of a driver of the vehicle,

said brake device comprising

mechanical brake means including a brake pedal having a pedal body mounted pivotally about a pivot axis carried by a stationary vehicle support structure, said mechanical brake means adapted to cause mechanical braking of the engine when pivoting about said axis,

electrical brake means including means for generating control signals to said electrical device to cause transfer of electrical energy to said power source, thereby providing a braking effect to said engine, and

a lever pivotally connected to said pedal body to effectuate a pivoting movement in response to an actuating operation produced by the vehicle driver, said lever controlling said means for generating control signals, said lever being pivotable into a first position in which it activates said means for generating control signals and thereby selectively activating only said electrical brake means until said lever reaches a threshold angle at which said lever is locked with said pedal body to become pivotally secured therewith, said lever and said pedal body being jointly pivotable into a second position exceeding said threshold angle which activates said mechanical brake means.

5,062,318

BICYCLE GEAR CRANK ASSEMBLY

Toshimasa Yamazaki, Sakai, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Nov. 26, 1990, Ser. No. 617,810

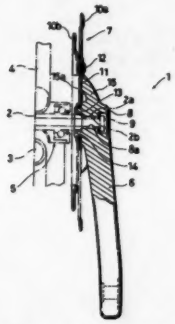
Claims priority, application Japan, Dec. 5, 1989, 1-141287[U]

Int. Cl.[5] G05G *1/14*

U.S. Cl. 74—594.2 **6 Claims**

1. A gear crank assembly for attachment to a crank shaft

comprising: a crank having a boss portion for fitting to a crank shaft; and a chainwheel including a largest sprocket and at least one smaller sprocket coaxial with said largest sprocket, said largest sprocket having a radially outer tooth carrying portion and a central portion mounted on said boss portion, said largest sprocket further having a plurality of stays extending radially outward from said central portion to said tooth carrying portion to define weight reduction openings between said stays,



wherein said boss portion of said crank is provided with a sprocket backup means located on the side of said largest sprocket laterally away from said smaller sprocket, said backup means extending radially outward from said boss portion beyond said central portion of said largest sprocket but short of said tooth carrying portion of said largest sprocket to contact each of said stays at least at an intermediate portion thereof, so that said backup means prevents said largest sprocket form laterally bending in a direction away from said smaller sprocket.

5,062,319

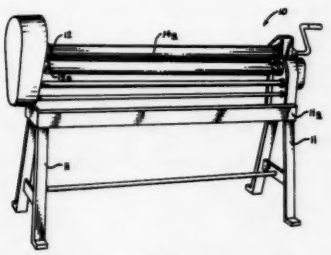
SHEET ROLLING MACHINE GUARD APPARATUS

Edward A. Beckner, 926 Florida St., Salem, Va. 24153

Filed Mar. 15, 1991, Ser. No. 670,181

Int. Cl.[5] F16D *1/02*

U.S. Cl. 74—612 **5 Claims**



1. A sheet rolling machine guard apparatus comprising, in combination,

a support framework, the support framework mounting a top roll spaced from and parallel a bottom roll,

and

a rear roll mounted rearwardly of and parallel the bottom roll,

and

a guard member including a top semi-cylindrical shield spaced above a bottom semi-cylindrical shield defining a gap therebetween, the top semi-cylindrical shield positioned forwardly of the top roll and the bottom semi-cylindrical shield positions forwardly of the bottom roll, with the top and bottom roll defining a roll gap, wherein the gap is substantially aligned with the roll gap,

and

the top shield including a top shield top linear end and a top shield bottom linear end, the bottom shield including a bottom shield top linear end and a bottom shield bottom linear end, wherein each linear end is arranged in a single plane,

and

a first link mounted adjacent the top shield bottom linear end and the bottom shield top linear end,

and

a second link mounted to the top shield bottom linear end and the bottom shield top linear end, wherein the first and second links are arranged parallel relative to one another and mounted adjacent opposed ends of the gap defined by the top and bottom shields.

5,062,320

DIFFERENTIAL MECHANISM

David Parsons, Kenilworth; Wilfred N. Bainbridge, Banbury; Alastair J. Young, Kenilworth, and Harry D. Temperley, Leamington Spa, all of England, assignors to 501 Automotive Products Plc, England

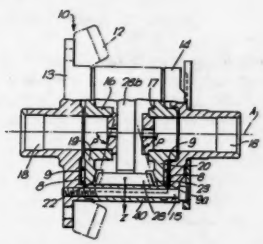
PCT No. PCT/GB89/00053, § 371 Date Jul. 11, 1990, § 102(e) Date Jul. 11, 1990, PCT Pub. No. WO89/06761, PCT Pub. Date Jul. 27, 1989

PCT Filed Jan. 19, 1989, Ser. No. 543,747

Claims priority, application United Kingdom, Jan. 22, 1988, 8801401; Feb. 25, 1988, 8804373

Int. Cl.[5] F16H *35/04*

U.S. Cl. 74—650 **25 Claims**

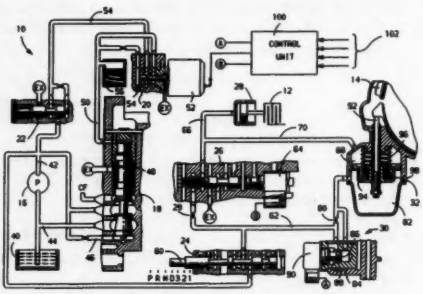


1. A differential mechanism comprising, two output cam members rotatable about an axis, each said member having a single annular cam surface thereon of undulating form comprising pairs of mutually inclined surfaces, the cam surface on each cam member comprising at least two identical tracks which form the complete annular cam surface, one of said cam members having a different number of said pairs of inclined surfaces thereon than the other of said cam members, the cam surfaces on the two cam members converging towards the axis, a plurality of substantially identical cam followers which have end surfaces thereon for engaging the cam surfaces of the output cam members, the arrangement being such that relative contra rotation of said output cam members causes the cam followers to slide axially, and an input element extending circumferentially around the cam followers and engaging with the radially outer portion of the cam followers to move the follower circumferentially relative to the output cam members, the cam followers being elongate in the direction of said axis and slidably supported at least towards ends thereof by the surrounding drive input element, the cam followers lying side by side with the adjacent side surfaces of each cam follower in contact with or lying closely to the side surfaces of each adjacent cam follower and during drive of said output cam members through the followers a force is created which urges the follower members radially outward towards said drive input element.

5,062,321
CONTROL APPARATUS FOR REGULATING ENGAGEMENT OF A FLUID OPERATED TORQUE TRANSMITTING DEVICE

Melissa M. Koenig, Ann Arbor, and William J. Vukovich, Ypsilanti, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 11, 1991, Ser. No. 667,141
Int. Cl.[5] F16H *61/06*
U.S. Cl. 74—866 **7 Claims**



1. A control system for controlling the supply of fluid to a servo chamber of predetermined volume which is filled to engage a fluid operated torque transmitting device, said control system comprising;

a source of fluid pressure;

pressure regulating means for regulating the pressure of said source of fluid pressure in accordance with a pressure command;

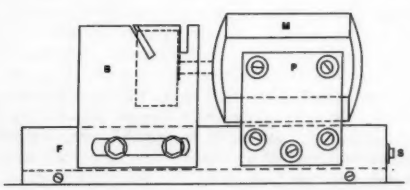
fluid restriction means including variable flow orifice means connecting said source of fluid pressure to said chamber, and electromagnetic means for adjusting the flow of said orifice means in accordance with a restriction command; and

control means for issuing a combination of pressure and restriction commands for filling the predetermined volume in a desired time, thereby to control an engagement rate of said torque transmitting device.

5,062,322
UNIVERSAL LAWN MOWER BLADE SHARPENING MACHINE

John E. Sinko, P.O. Box 586, Blanchard, Okla. 73010

Filed Sep. 28, 1989, Ser. No. 413,727
Int. Cl.[5] B21K *11/00*
U.S. Cl. 76—82.1 **4 Claims**



1. A self contained lawn mower blade sharpening machine, said machine comprising;

(a) base means for the purpose of attachment to a work bench;

(b) electric motor means attached to said base means via vibration isolators, for the purpose of providing power to a working surface;

(c) composite abrasive wheel means attached to said motor drive means allowing both sides of the lawn mower blade to be sharpened without machine adjustment; and

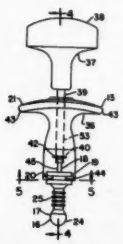
(d) a laterally traveling blade guide means attached to said base means for grinding both sides of the lawn mower blade;

(e) said blade guide means totally enveloping said abrasive wheel means thereby making it virtually impossible for the operators hand to contact the abrasive wheel means.

5,062,323
TIRE REPAIR PLUG AND INSTALLATION TOOL

Simon Roberts, Southfield; John A. Battista, Livonia, and Alex Rhodes, West Bloomfield, all of Mich., assignors to Baseline Products, Inc., Southfield, Mich.

Filed Jul. 31, 1989, Ser. No. 387,972
Int. Cl.[5] B29C *73/08, 73/06*
U.S. Cl. 81—15.7 **11 Claims**



1. A plug and tool for repairing a puncture of a vehicle tire comprising: an assembly of a generally cylindrical plug made of a rubber material, a cylindrical shank portion having a circular aperture disposed on the axis of said plug and an enlarged cylindrical head end portion adjoining said shank portion which is adapted for engaging a tool to insert the plug into a puncture and a slender cylindrical core for engaging said aperture, one end portion of said core projecting outwardly from said plug for engaging the end of a shank of a tool; and a tool for elongating and inserting said plug into a puncture of a tire, said tool having a frame with a slotted foot portion for releaseably engaging said enlarged head portion of said plug and a shank slideably mounted in said frame, said shank having an end portion for releaseably engaging said outward projecting end of said core.

5,062,324
HAND HAMMER

Thomas A. Saviano, 13866 Skyline Blvd., Woodside, Calif. 94062

Filed Sep. 4, 1990, Ser. No. 578,727
Int. Cl.[5] B25C *1/00*
U.S. Cl. 81—20 **16 Claims**

1. A hand hammer comprising

(1) a handle, and

(2) a head which has a substantially planar striking surface for striking nails, the handle having a single straight axis between the head and all points on the handle at which the handle can be grasped by a hand when the hammer is being used to strike a nail, and the striking surface being inclined away from the handle so that, if

(a) the striking surface is held against a flat horizontal surface, and

(b) the hammer is viewed horizontally,

the axis of the handle is inclined to the horizontal at an angle ϕ which is greater than 0°, with the end of the handle adjacent the head being lower than the end of the handle remote from the head.

5,062,325

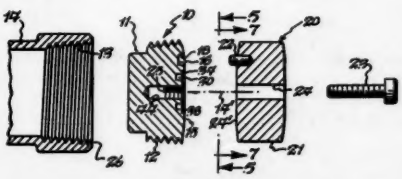
PIPE PLUG AND CENTERING CONSTRUCTION FOR CENTERING RIDGED KEY IN MATING GROOVE IN PIPE PLUG OR NUT

Durham S. McCauley, and Jeffrey R. Sullivan, both of Boston, N.Y., assignors to McGard, Inc., Orchard Park, N.Y.

Continuation of Ser. No. 100,536, Sep. 24, 1987, abandoned, which is a division of Ser. No. 900,975, Aug. 27, 1986, Pat. No. 4,712,586, which is a continuation of Ser. No. 732,675, May 10, 1985, abandoned. This application Jan. 26, 1989, Ser. No. 302,062

Int. Cl.[5] B25B *13/48*

U.S. Cl. 81—436 **20 Claims**



1. A body member having an axis of rotation, threads on said body member for mounting said body member on an object, a face on said body member which is transverse to said axis of rotation, undulating curvilinear key-receiving groove means in said face, a mating key counterbore means having a side in said face in alignment with said curvilinear key-receiving groove means for engaging said mating key and permitting said mating key to rotate relative to said body member while in contact with said side prior to alignment of said mating key with said curvilinear key-receiving groove means prior to entry of said mating key into said curvilinear key-receiving groove means and to permit said mating key to enter into said curvilinear key-receiving groove means after alignment between said mating key and said curvilinear key-receiving groove means, curvilinear ridge means on said mating key for mating engagement with said curvilinear groove means, said curvilinear ridge means having spaced outer circumferential areas for engagement with said side of said counterbore means to align said curvilinear ridge means relative to said curvilinear key-receiving groove means during rotation of said mating key, a base on said mating key, said curvilinear ridge means being mounted on said base, and said base having an outer surface with a circumference which provides a close fit with said side of said counterbore means, whereby said outer surface of said base is in contiguous relationship to said side of said counterbore when said curvilinear ridge means is in said curvilinear groove to thereby stabilize said curvilinear ridge means in said curvilinear key-receiving groove means.

5,062,326

POWER-DRIVEN OR MANUALLY-OPERATED WRENCH PULLER FOR TIGHTENING OR LOOSENING THREADEDLY-ENGAGED WORK PIECES

Steven H. Goldschmidt, 10 Greenbrier Dr., Bloomfield, Conn. 06002

Filed Nov. 21, 1990, Ser. No. 616,838

Int. Cl.[5] B25B *13/00*

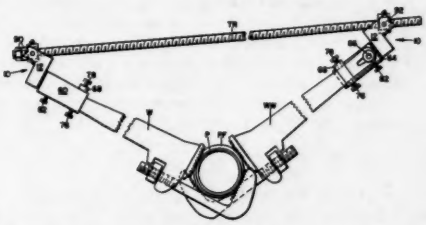
U.S. Cl. 81—57.32 **4 Claims**

1. In a manually or mechanically or hydraulically or electrically operated wrench puller system for tightening or loosening a threaded connection in a workpiece with a multiplied pulling force comprising:

a pair of wrenches each grippingly engaged with one of the threaded components of the workpiece,

a turret disposed at the opposite extremity of each wrench and including independently pivotable and rotatable inner and outer pivot blocks swingable with respect to each other in a substantially friction free manner in mutually perpendicular axes,

a connector means connecting each wrench to its respective turret,



a threaded tie rod extendable between and through each turret,

a pair of nuts tightened together and threadedly engaged on the tie rod outboard of an adjacent one of the turrets,

single nut threadedly engaged on the tie rod within an adjacent one of the turrets,

adapted and arranged whereby rotation of the tie rod responsive to the tihghtening of the pair of nuts effects concomitant angular deviations of the inner and outer pivot blocks of the pair of turrets and the resultant axial displacement of the wrenches as they are driven toward each other.

5,062,327

YOKE NUT TIGHTENING WRENCH

Alva C. Hammons, 760 Yell Rd.; James R. Sanders, 949 Midway St., and Franklin J. Ulrich, 1199 Nashville Highway, Apt. 14, all of Lewisburg, Tenn. 37091

Filed Dec. 28, 1990, Ser. No. 635,740

Int. Cl.[5] B25B *13/06*

U.S. Cl. 81—124.3 **7 Claims**

1. A wrench disposed for insertion into a yoke/U-joint assembly of a vehicle, said yoke provided with extending spaced trunnions and having a body provided with a recess for receiving a yoke securing nut therein, said recess disposed on said body between said trunnions, said nut disposed for threaded engagement with a threaded portion of a shaft to which said yoke is to be secured, said threaded portion of said shaft extending through an opening in said body of said yoke for secured relation thereto responsive to said threaded engagement with said nut, said wrench comprising:

a handle having first and second ends and first and second sides and a neck portion at said first end, said neck portion having a dimensionally reduced cross section relative to said sides of said handle, to form a neck portion of predetermined thickness a predetermined width; and

a nut engaging head secured to said neck portion, said head including an extending portion of predetermined diameter for insertion into said recess of said body of said yoke, said

head including said extending portion provided with an inner nut engaging surface for engaged relation of said nut in said recess;

said handle and said head are provided with mating planar upper surfaces;

said predetermined with of said neck portion is provided by providing each said side, at said neck portion, with a cut-away portion, said cut-away portions providing said neck portion with a smaller width than the remainder of said handle, said cut-away portions permitting said handle to be swung in a wider arc than would be otherwise possible without said cut-away portions; and

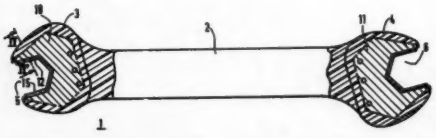
said neck portion includes upper and lower surfaces, and said predetermined thickness of said neck portion is provided by providing said lower surface of said neck portion with a recessed surface, to reduce the thickness of said neck portion relative to the thickness of said head and said handle, said recessed surface permitting insertion and rotational movement of said neck portion and head between adjacent spaced surfaces of said yokes.

5,062,328

PLASTIC WRENCH WITH METAL INSERT

Jean P. Demurger, Roanne, France, assignor to Demurger et cie, France

Filed Feb. 28, 1990, Ser. No. 486,090
Claims priority, application France, Mar. 2, 1989, 89 02997
Int. Cl.[5] B25B *13/00*
U.S. Cl. 81—186 **7 Claims**



1. A high strength molded wrench for engaging a grippable member that includes:

a metal insert having parallel top and bottom walls, end walls and an opening passing inwardly through one end wall to form a pair of jaws having opposed walls for engaging a grippable member,

body means formed of a high strength moldable material having a head that is molded over said insert to encompass the top wall, bottom wall and end walls said insert, said head having an opening that complements the opening in the insert to expose only the opposed gripping walls, and an elongated handle means extending from said head.

5,062,329

LEAF TAMPER FOR CHIPPER/SHREDDER

Kevin J. Connolly, Ballston Lake; James M. D'Aleo, Clifton Park, both of N.Y., and Clifford J. Griffith, Clemmons, N.C., assignors to Garden Way Incorporated, Troy, N.Y.

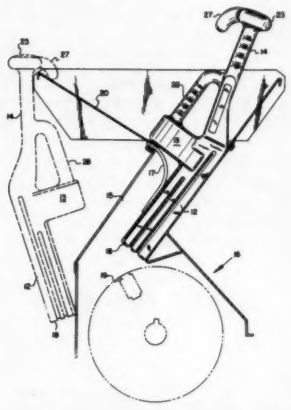
Filed Jul. 17, 1990, Ser. No. 554,202
Int. Cl.[5] B25B *33/00*
U.S. Cl. 81—488 **8 Claims**

1. A tamping tool for pushing materials contained in a hopper of a chipper/shredder device through a throat of predetermined, fixed, non-circular cross section of the hopper and towards high speed, rotating pulverizing elements of the device, comprising:

a pushing member having a working end configured for insertion into said hopper throat for pushing materials contained in said hopper into said hopper throat and towards said pulverizing elements, said member having a non circular cross section that closely engages at least a portion of the throat to preclude rotation of the member in said hopper throat thereby allowing only slideable pushing movement of said member in said throat;

an operator engageable handle on an end of said member; and

a safety stop intermediate the length of said member for



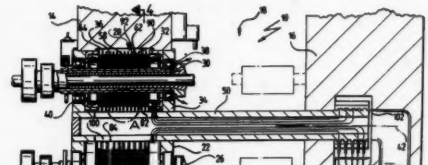
engagement with said hopper to limit the distance said member may be inserted into said throat, said stop precluding engagement of said working end with said pulverizing elements.

5,062,330

MACHINE TOOL WITH A COOLED MOTOR SPINDLE

Guenther H. Trautmann, Kirchheim-Nabern, and Helmut F. Link, Aichwald 1, both of Fed. Rep. of Germany, assignors to Index-Werke Komm.-Ges. Hahn & Tessky, Fed. Rep. of Germany

Filed Dec. 27, 1989, Ser. No. 457,258
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1988, 3844337
Int. Cl.[5] B23B *19/02*
U.S. Cl. 82—147 **20 Claims**



1. A machine tool comprising:

a motor spindle having a work spindle and a main motor, said main motor being integrated into and carried by said work spindle coaxially with a spindle axis thereof, said work spindle being mounted in at least two bearings, one of said bearings comprising a spindle bearing facing a working area of said machine tool, said main motor having a rotor and a stator, said stator having stator plates forming, for their part, cooling surfaces; and

a cooling device designed to supply a gaseous coolant to said main motor under pressure above atmospheric, said gaseous coolant being conducted directly along said cooling surfaces of said stator plates and to said spindle bearing

facing said working area for acting upon said spindle bearing to counteract penetration of dirt and liquid from said working area into said spindle bearing.

5,062,331

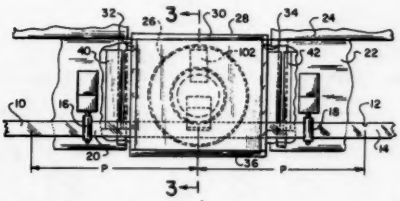
APPARATUS AND METHOD FOR EDGE NOTCHING A CONTINUOUSLY MOVING WEB

Vratislav M. Michal, and Ralph S. Barbaro, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 7, 1989, Ser. No. 390,129

Int. Cl.[5] B26D *1/56*

U.S. Cl. 83—37 **8 Claims**



1. Apparatus for edge notching a moving web, comprising:

first means for supporting such web to provide a substantially straight run of such moving web;

at least one die means having an opening for at least partially defining the geometry of a notch to be made in such moving web;

at least one cylindrical punch means having a shape and a shearing edge for cooperating with said opening to form such notch;

second means for supporting said die means and said punch means on opposite sides of such moving web;

means for rotating said second supporting means about an axis substantially perpendicular to the plane of such straight run so that said punch means and said die means move in substantially parallel planes on said opposite sides; and

means for driving said shearing edge of said punch means through such moving web and said die means at least once during each revolution to form such notch and for withdrawing said shearing edge of said punch means after formation of such notch, said punch means comprising a first radially extending slot through which an edge portion of such moving web passes prior to actuation of said means for driving, said shearing edge being formed by said first slot, and a second radially extending slot, spaced axially on said punch means from said first slot, through which an edge portion of such moving web passes after actuation of said means for driving.

5,062,332

CUTTING MACHINE FOR CUTTING FLAT WORKPIECES

Gottfried Blaimschein, Steyr, and Harald Dietachmayr, Ternberg, both of Austria, assignors to GMF Gesellschaft für Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Sep. 21, 1990, Ser. No. 586,420

Claims priority, application European Pat. Off., Sep. 25, 1989, 89890248

Int. Cl.[5] B23Q *17/22*

U.S. Cl. 83—74 **2 Claims**

1. A cutting machine for cutting a flat workpiece, which comprises

(a) a cutting table having a working surface for supporting the flat workpiece,

(b) a support movable substantially parallel to the working surface,

(c) a cutting unit mounted on the support above the working surface, the cutting unit comprising

(1) a cutting knife vertically adjustable perpendicularly to the working surface to regulate the cutting depth of the knife,

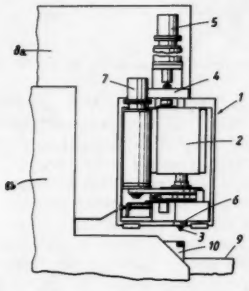
(2) a vertically displaceable carriage for the cutting knife for vertically adjusting the knife,

(3) a cutting knife holder rotatable about a vertical axis for orienting the knife into desired angular positions, and

(4) drive means actuatable for displacing the carriage rotating the holder and moving the support relative to each other in response to a programmable control, and

(d) a setting device for the cutting knife, the setting device being mounted on the support and comprising

(1) a vertically extending positioning path indicator extending perpendicularly to the working surface and having a measuring head arranged to be engaged by the cutting knife upon vertical displacement thereof to indicate the actual position of the cutting knife in a set position and to transmit to the control a signal determined by a deviation of the actual position of the measuring head from a pre-set vertical position thereof relative to the working surface whereby a reference point for the vertical adjustment of the cutting knife is put in the control,



(2) a horizontally extending positioning path indicator extending in a plane parallel to the working surface and defined by the pre-set vertical position of the measuring head, the horizontally extending positioning path indicator having a measuring head arranged to be engaged by the cutting knife upon angular displacement thereof in the pre-set vertical position to indicate the changing angular positions of the cutting knife in set positions occurring during rotation of the cutting knife holder about the vertical axis and to transmit to the control signals corresponding to the angular positions whereby a reference point for the angular adjustment of the cutting knife is put in the control, and

(3) a common housing for the vertically and horizontally extending positioning path indicators.

5,062,333

SHEARING MACHINE

Kazui Ogasawara, Kanagawa, Japan, assignor to Amada Company, Limited, Japan

Continuation-in-part of Ser. No. 227,133, Aug. 2, 1988, abandoned. This application Dec. 15, 1988, Ser. No. 285,396

Claims priority, application Japan, Aug. 3, 1987, 62-118130; Aug. 3, 1987, 62-192603; Aug. 5, 1987, 62-119307

Int. Cl.[5] B26D *1/08, 7/32*

U.S. Cl. 83—94 **2 Claims**

1. A shearing machine for shearing a plate workpiece comprising:

a frame;

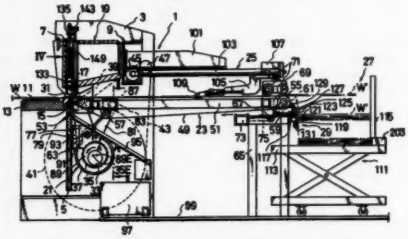
a ram having an upper cutting blade and being mounted on the frame in a vertically movable manner;

a worktable having a lower blade and being fixedly mounted on the frame;

a conveying means for conveying a sheared plate workpiece;

a storage means positioned at the delivery end of the conveying means for receiving the sheared plate workpiece in a stacked manner;

a stopper means being movably guided on a guide means provided along a rear side of the storage means, in an X-direction parallel to the cutting blades for aligning a pile of the sheared plate workpieces stacked at a selected place on the storage means and further movable in a Y-



direction crossing normal to the X-direction, said stopper means provided with a lock means comprising a rotatable member having a cam surface, said cam surface having a minimum and maximum radial dimension which positively shifts the stopper means tin the Y-direction by a displacement distance no greater than the difference between said maximum and minimum radial dimensions to approach the conveying means when securing the stopper means on the guide means, said lock means being adapted to positively move the stopper means to a position spaced apart form the stacked pile of the sheared plate workpiece by said displacement distance when releasing the secured stopper means so that the stopper means is unlocked to move freely along the guide means.

5,062,334

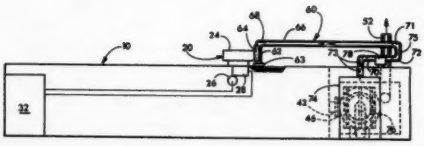
APPARATUS FOR CLEANING CUTTING TABLE SUPPORT SURFACE

Timothy R. Killilea, 5636 W. Reighmoor Rd., Omro, Wis. 54963, and David W. Sattler, Rte. 1, Box 161, Pine River, Wis. 54965

Filed May 21, 1990, Ser. No. 527,071

Int. Cl.[5] B26D *7/18*

U.S. Cl. 83—99 **13 Claims**



10. In an apparatus for cutting sheet material comprising a cutting table including an air-permeable support surface for said sheet material; a vacuum chamber disposed below said support surface; carrier means, including cutting means, supported above said support surface for longitudinal and transverse movement relative to said table; and vacuum generating means including fluid communication means to said vacuum chamber for applying a vacuum to hold down said sheet material on said support surface during cutting operation; the improvement comprising:

(a) sweeper means having a nozzle mounted on said carrier means and adaptable for contacting said support surface, and including fluid communication means to said vacuum generating means;

(b) a substantially cylindrical filter means disposed intermediate said nozzle and said vacuum generating means,

(c) housing for said filter means, said filter means concentrically disposed in said housing,

(d) conduit means mounted to said housing and extending from said nozzle to provide fluid communication to said housing at one surface of said filter means,

(e) fluid communication means from the opposite surface of said filter means in said housing to said vacuum generating means, and

(f) valve means for cutting off vacuum to said vacuum chamber and opening vacuum to said sweeper means for cleaning said support surface.

5,062,335

HORIZONTAL BAND-SAW

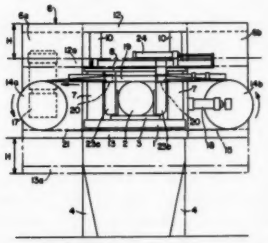
Patrick Missler, 12, rue de Tournehem, F-91450 Etiolles, France

Filed Oct. 12, 1989, Ser. No. 420,462

Claims priority, application France, Oct. 17, 1988, 88 13631

Int. Cl.[5] B23D *55/02;* **B26D** *1/46;* **B27B** *13/02*

U.S. Cl. 83—168 **5 Claims**



1. A horizontal band-saw comprising a workpiece-supporting table, a work unit mounted for vertical movement relative to the table, said unit having two lateral portions located on opposite horizontal sides of said table each said portion serving as a support for a respective vertical wheel for driving and guiding an endless saw blade that passes about said wheels, the saw blade having two horizontal runs that extend between said wheels respectively above and below said table, two vertical sleeves fixed to said table, and two vertical columns each of which is slidable vertically in a respective one of said sleeves, said vertical columns having upper and lower ends, said lower ends of said vertical columns being secured to a horizontal crosspiece that interconnects said two portions at the bottom of said unit and said upper ends of said columns being secured to a horizontal crosspiece which interconnects said portions at the top of said unit.

5,062,336

HOT SHEARING APPARATUS

Friedrich W. Elhaus, Moos, Fed. Rep. of Germany, assignor to Elhaus Industrieanlagen GmbH, Rielasingen, Fed. Rep. of Germany

Filed Dec. 5, 1989, Ser. No. 446,043

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1988, 3841584

Int. Cl.[5] B26D *3/16, 7/02*

U.S. Cl. 83—198 **6 Claims**

1. A hot shearing apparatus for shearing heated round or flat section bars, especially of light metal, in billets, comprising:

a stationary shearing ring;

a moveable shearing ring, and

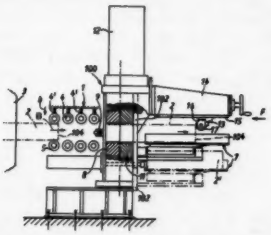
a drive means for generating shearing movement of the movable shearing ring,

wherein the stationary shearing ring is formed by two shell halves arranged such that, when the two shell halves of

the stationary shearing ring are in a closed position, the interface between the two shell halves is in a plane containing a diameter of the closed position of the stationary shearing ring,

said shell halves of the stationary shearing ring being adapted to be spread apart in a direction transversely to the shearing movement of the moveable shearing ring, and

wherein the moveable shearing ring is formed by two shell



halves arranged such that, when the two shell halves of the moveable shearing ring are in a closed position, the interface between the two shell halves is in a plane containing a diameter of the closed position of the moveable shearing ring,

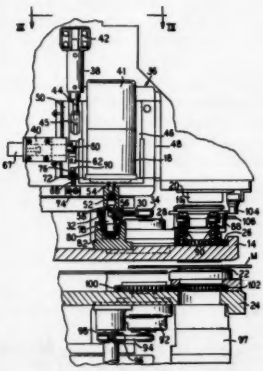
said shell halves of the moveable shearing ring being adapted to be spread in a direction which is offset by 90° with respect to the spreading direction of the stationary shearing ring.

5,062,337

INDEXABLE MULTI-TOOL FOR PUNCH PRESS

Gary E. Johnson, Ramsey, Minn., and Richard M. Eckert, Eggertsville, N.Y., assignors to Strippit, Inc., Akron, Ohio

Filed May 12, 1989, Ser. No. 351,413
Int. Cl.[5] B26D *5/02*
U.S. Cl. 83—552 **24 Claims**



1. In a punch press for punching a sheet material, the combination comprising:

a housing;

a ram reciprocably mounted in said housing;

a punch assembly removably supported below said ram and including a striker means, a punch carrier means and a stripper guide means underlying said ram, at least two punches supported by said punch carrier means and movable relative to said stripper guide, said punches each having a working end adapted to strike the associated sheet material and an opposite end being selectively engageable, when in a working position, by said striker means acted upon by said ram, to move said punch along an axis parallel to the axis of reciprocation of said ram, and control means for moving a selected one of said punches to said working position and concurrently operable to dispose the at least one other punch in an inactive position so that only the selected one of said punches is in said working position;

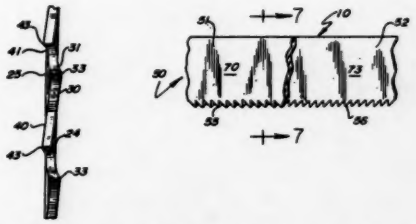
wherein said striker means includes a radially and axially projecting portion which overlies said punch carrier means, and said punch carrier means is rotatable below said striker means to present a selected one of said punches below said projecting portion.

5,062,338

HACKSAW BLADE WITH BI-DIRECTIONAL TEETH

Slade H. Baker, 109 ½ Broad St., Mankato, Minn. 56001

Filed Mar. 13, 1990, Ser. No. 492,834
Int. Cl.[5] B27B *21/02*
U.S. Cl. 83—848 **2 Claims**



1. A hacksaw blade for being mounted on a hacksaw for sawing an object, the blade producing a cut and particulate matter when sawing the object, the blade comprising

a blade with two ends, first and second edges, and opposing faces, the blade further having an axis disposed equidistant from the first and second edges and extending between the ends, the blade further having a pair of apertures for connecting the blade to the hacksaw, each of the apertures adjacent one of the ends

a first set of teeth being disposed on the first and second edges of the blade to saw the object in one sawing direction from one of the ends to the other end of the blade, each of the teeth of the first set having a linear clearing edge disposed at an acute angle relative the axis, each of the teeth of the first set further having an elliptic cutting edge, each of the liner clearing edges and each of the respective elliptic edges forming a tip, and

a second set of teeth being disposed on the first and second edges to saw the object in an opposite sawing direction, each of the teeth of the second set being a mirror image of each of the teeth of the first set on their respective edges and having corresponding linear clearing edges, elliptic cutting edges, and tips, each of the teeth of the first set being arranged in an alternating fashion with each of the teeth of the second set, each of the linear clearing edges of the first set of teeth being adjacent to and leading into one of the linear clearing edges of the second set and forming the shape of a V, the elliptic cutting edges of the first set

leading into the elliptic cutting edges of the second set and forming essentially the shape of half of an ellipse, the tips of the first set extending outwardly relative to one of the faces of one of the blade and the tips of the second set extending outwardly relative to the other face of the blade so that the tips are staggered relative to each other, each of the adjacent linear edges which form the shape of a V being linear relative to each other to be disposed substantially in the same plane and lying obliquely relative to the blade whereby each of the first and second blade edges saws the object and clears particulate in both of the sawing directions.

5,062,339

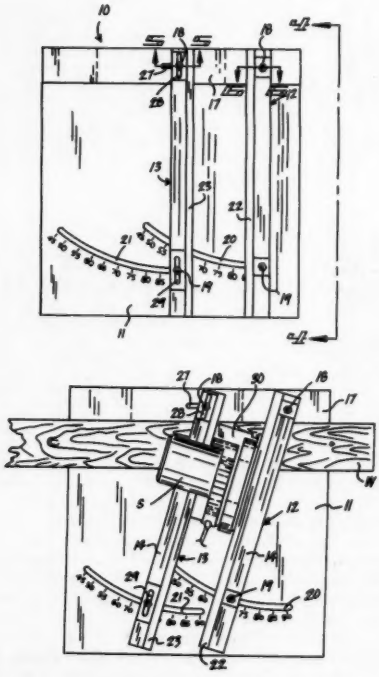
SAW GUIDE APPARATUS

William Campos, 7080 Kayo Dr., Penryn, Calif. 95663

Filed Dec. 31, 1990, Ser. No. 636,187

Int. Cl.[5] B27B *9/04*

U.S. Cl. 83—763 **1 Claim**



1. A saw guide apparatus comprising:

a planar support base, the support base including an elongate rear edge spaced from and parallel a forward edge, and the rear edge and forward edge spaced apart a predetermined length, and

a first track member and a second track member mounted overlying the support base, and

each respective first and second track member including a respective first and second horizontal leg fixedly and orthogonally mounted to a respective first and second vertical leg, the first horizontal leg pivotally mounted to the support base adjacent the rear edge, and the second horizontal leg pivotally mounted to the support base adjacent the rear edge independent of the first horizontal leg, and

the respective first and second vertical legs pivotally mounted independent of one another overlying the base adjacent the forward edge of the base, and

including a mounting block fixedly mounted overlying the support base coextensive with the rear edge and including a planar forward surface orthogonally oriented relative to the planar base, and

the support block defined by a predetermined height, and

each vertical leg of each first and second track member defined by a height equal to the predetermined height wherein the first and second track member each define an enclosed gap to receive a work piece therethrough wherein the enclosed gap is defined by the base, the horizontal leg of each respective first and second track member, and a forward vertical leg of each respective first and second track member, and

wherein each horizontal leg of each respective first and second track member includes a respective first and second "L" shaped guide mounted thereon, each "L" shaped guide including a horizontal "J" shaped guide leg overlying each respective horizontal leg of each respective first and second track member to define a respective first and second "U" shaped track of each first and second track member wherein each first and second "U" shaped track are in a confronting parallel relationship to receive a saw guide plate of an associated saw therebetween, and

wherein the second horizontal leg of the second track member includes a rear pivot boss and the rear pivot boss of the second track member is slidably adjustable within a rear pivot slot longitudinally aligned through the mounting block and the support base, and the horizontal leg of the second track member including a rear horizontal leg slot orthogonally oriented and bisecting the rear pivot slot to receive the rear pivot fastener boss therethrough, and wherein the horizontal leg of the second track member further includes a forward horizontal leg slot longitudinally aligned with the rear horizontal leg slot to longitudinally adjust the second track member relative to the support base, and

wherein the forward horizontal slot of the second track member includes a forward pivot fastener boss directed therethrough wherein the forward pivot boss is further directed orthogonally through the planar support base and is slidably adjustably mounted within a second arcuate guide slot, and further including a first arcuate guide slot to receive a forward pivot fastener boss directed through the horizontal leg of the first track member to permit parallel pivotment of the first track member relative to the second track member, and

wherein the horizontal leg of the first track member includes a rear pivot fastener boss orthogonally directed through the horizontal leg, the mounting block, and the base, and each rear and forward pivot fastener boss of each horizontal leg of the respective first and second track members are arranged parallel relative to one another.

5,062,340

CUTTING AND POSITIONING APPARATUS

Richard Greven, 1015 Linda Vista Dr., Bldg. C, San Marcos, Calif. 92069

Filed Jun. 21, 1990, Ser. No. 541,790

Int. Cl.[5] B32B *31/18, 31/08*

U.S. Cl. 83—95 **9 Claims**

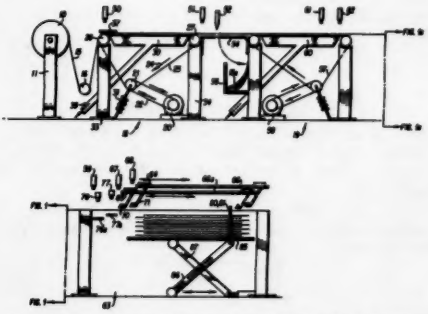
8. An apparatus for cutting a continuous web into sheets of predetermined length and for stacking the sheets so cut, in a precise position, relative to each other, said apparatus comprising:

a) a means for securing a portion of said continuous web to a moving surface for moving said portion of said continuous web in a predetermined direction of travel;

b) a web shearing means for cutting said continuous web transverse to said predetermined direction of travel for forming a leading edge on said continuous web and for cutting said continuous web into sheets;

c) a web stop means, positioned downstream in said predetermined direction of travel from said web shearing means, for stopping said continuous web with said leading edge in a predetermined relationship to said web stop means for cutting said continuous web into a cut sheet of predetermined length by said web shearing means;

d) a detector means for detecting each of two laterally spaced, predetermined points on said cut sheet for orienting said cut sheet in accordance with a position of said detector means, said detector means positioned in a first predetermined position when detecting said two laterally spaced, predetermined points on a first cut sheet for orienting said first cut sheet in a first predetermined oriented condition and said detector means positioned in a second position when detecting said two laterally spaced predetermined points on a next cut sheet for orienting said next cut sheet in a second predetermined oriented condition;



e) a hole punch means for punching a first hole and a second hole in each said cut sheet when said cut sheet is oriented in accordance with said position of said detector means, said detector means being positioned at said first predetermined position when said first hole and said second hole are punched in said first cut sheet and said detector means is positioned at said second predetermined position when said first hole and said second hole are punched in said next cut sheet for offsetting said first hole and said second hole in said first cut sheet from said first hole and said second hole in said next cut sheet; and

f) a first pin and a second pin extending from a stacking bed, said first pin and said second pin spaced laterally from each other so that said first hole and said second hole align with said first pin and said second pin, respectively, and said first pin passes through said first hole and said second pin passes through said second hole when said cut sheet is on said stacking bed for offsetting adjacent cut sheets, in a stack of cut sheets on said stacking bed, from each other.

5,062,341

PORTABLE DRUM SOUND SIMULATOR GENERATING MULTIPLE SOUNDS

Victor G. Reiling, West Cornwell, and Bryan L. Dean, Torrington, both of Conn., assignors to Nasta International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 333,879, Mar. 31, 1989, Pat. No. 4,909,117, which is a continuation of Ser. No. 149,656, Jan. 28, 1989, abandoned. This application Dec. 29, 1989, Ser. No. 458,601

Int. Cl.[5] G10H *1/057, 5/00*

U.S. Cl. 84—702 **9 Claims**

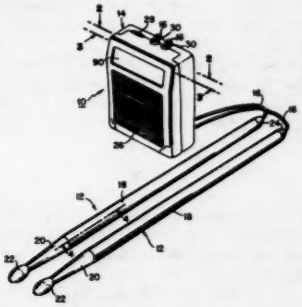
1. A portable drum sound simulator comprising:

a portable enclosure having therein drum sound generating means comprising an electronic circuit having a power source and energizable in response to momentary electrical trigger signals for generating two different audible drum-like sound outputs each in response to a corresponding trigger signal;

a sound select switch connected to the electronic circuit and having means for selectively selecting which said drum-like sound output the drum sound generating means generates;

tone pitch varying means connected in the electronic circuit for varying the tone pitch of generated drum-like sound outputs;

a tone select switch connected to the tone pitch varying means comprising means for selecting a higher tone pitch than one previously set, means for selecting a lower tone pitch than one previously set and means for maintaining a selected tone pitch;



two normally open independently activated switches connected to the electronic circuit and momentarily closable for developing the momentary electrical trigger signals for independently effecting energizing of the drum sound generating means when momentarily closed and generating the drum-like sound outputs; and

two drumsticks each having a corresponding one of the two independently activated switches and movable in a striking motion in any desired direction at an accelerated velocity and decelerated at a certain rate momentarily at will while moving in said any direction for effectively generating the electrical trigger signals, each said independently activated switch having means for detecting momentary deceleration of the corresponding drumstick and effecting momentary closing of the corresponding switch in response to the detection of the momentary decelerations and effecting generating of the momentary electrical trigger signals.

5,062,342

PIANO ACTION DEVICE FOR ELECTRONIC KEYBOARD MUSICAL INSTRUMENTS

Shigeyuki Nagatsuma, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,977

Claims priority, application Japan, Dec. 28, 1988, 63-169125[U]; Dec. 28, 1988, 63-169126[U]

Int. Cl.[5] G10C *3/12;* **G10H** *1/34*

U.S. Cl. 84—744 **5 Claims**

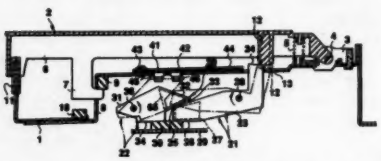
1. A piano action device for electronic keyboard musical instruments, comprising:

a keyboard chassis;

a key mounted on said keyboard chassis so as to be swingable up and down;

an action mechanism located under said key, and including first and second hammer arms, said first hammer arm being swingable up and down in response to the swingable movement of said key, said second hammer arm being

swingable up and down in response to the swingable movement of said first hammer arm, a swing center of said first hammer arm and a swing center of said second hammer arm being separated from each other in a longitudinal direction of said key and arranged on substantially the same horizontal plane, and one end of said second hammer arm near said first hammer arm being located on one end of said first hammer arm near said second hammer arm



thereby transmitting the swingable movement of said first hammer arm to said second hammer arm to cause it to swing; and

means for detecting a swing speed of said second hammer arm and generating a musical-sound-characteristic indicating signal to control characteristics of musical sounds to be generated in response to the detected swing speed of said second hammer arm.

5,062,343

METHOD AND A DEVICE FOR FILLING A SPACE IN AN AMMUNITION UNIT WITH EXPLOSIVE

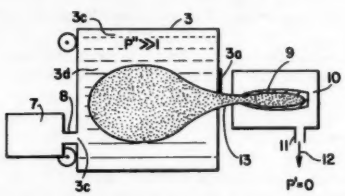
Per Sjöberg, Karlskoga, Sweden, assignor to Nobel Kemi AB, Karlskoga, Sweden

Filed May 29, 1990, Ser. No. 529,458

Claims priority, application Sweden, May 29, 1989, 8901900

Int. Cl.[5] F42B *4/00*

U.S. Cl. 86—20.1 **12 Claims**



1. A method of filling a space in at least one ammunition unit with a ready-mixed explosive containing a substance which imparts high viscosity to said explosive, said method comprising the steps of:

supplying said explosive into a flexible container having a single opening therein;

positioning said flexible container into a second container adapted to withstand high internal pressure;

applying a high pressure into said second container thereby exposing said flexible container to said high pressure;

pressing out said explosive from said flexible container through said opening in said flexible container into said space in said ammunition unit upon application of said high pressure whereby filling said space with said explosive.

5,062,344

BOWLINE KNOT IN A BRAIDED LINE

Thomas F. Gerker, DeLand, Fla., assignor to Sparton Corporation, Jackson, Mich.

Filed Apr. 12, 1990, Ser. No. 507,952

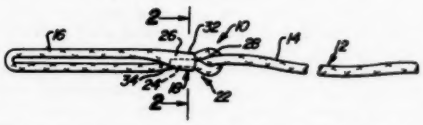
Int. Cl.[5] D04C *1/12*; D07B *7/18*

U.S. Cl. 87—8 **4 Claims**

1. The method of making an eye splice in a cord of the hollow braid type, said cord having a tubular wall and a hollow center, said method comprising the steps of:

forming a bight in the free end of a standing part of the cord,

inserting the bight through the wall on the standing part into the hollow center at an entry point and through the hollow center to a take-out point on the standing part,



extracting a loop of said bight through said wall at said take-out point leaving an overlap section of the standing part surrounding the free end of said bight between said entry point and said take-out point, thereby forming an eye, and said eye and bight being on the opposite sides of said overlap section,

passing the standing part through the loop of said bight, and tightening said bight around said standing part.

5,062,345

CAP FOR A ROCKET EXIT OPENING

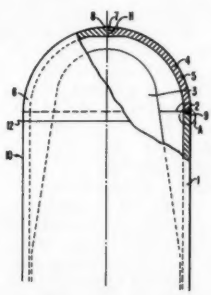
Marek Tegel, deceased, late of Wedel by Anita Tegel, heir , and Dieter Wenzel, Haseldorf, all of Fed. Rep. of Germany, assignors to DMT Marinetechnik GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 7, 1990, Ser. No. 623,768

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1989, 3940468

Int. Cl.[5] F41F *3/077*

U.S. Cl. 89—1.817 **6 Claims**



1. A cap for a rocket exit opening of a mobile rocket launcher for a submarine which is guided to the surface of the water in order to launch an air rocket which pushes out the cap when it is launched, wherein the exit opening presents a peripheral edge, comprising:

pressed together cap segments for covering the exit opening of the mobile rocket launcher, said cap segments being shaped so that externally applied force components which are radial with respect to the longitudinal axis of the submarine act on said segments, said cap segments presenting a peripheral edge which cooperates with the peripheral edge of the exit opening to form at least partly a form locking plug-in connection with one another which is held together by external force components acting in the axial direction of the submarine; and

a tear-away, pressure resistant, slightly elastic and watertight, thin sheet adapted for attachment to the submarine and being stretched over said cap segments when it is attached to the submarine.

5,062,346

HEAT PROTECTIVE COVERING FOR A PIPE AND A ROD-SHAPED ARTICLE, ESPECIALLY FOR GUN BARRELS

Niels F. Greve Hansen, Jerslev, and Jørn H. Greve Hansen, Kalundborg, both of Denmark, assignors to Dansk Industri Syndikat A/S, Denmark

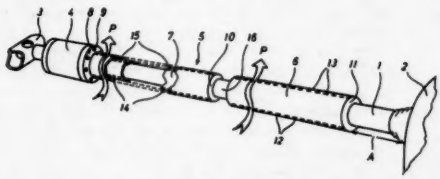
PCT No. PCT/DK89/00136, § 371 Date Nov. 21, 1990, § 102(e) Date Nov. 21, 1990, PCT Pub. No. WO89/11628, PCT Pub. Date Nov. 30, 1989

PCT Filed May 24, 1989, Ser. No. 603,713

Claims priority, application Denmark, May 25, 1988, 2839/88

Int. Cl.[5] F41A *13/12*

U.S. Cl. 89—14.1 9 Claims



1. A heat protective covering for gun barrels of a calibre of 40 to 120 mm, characterized in that the heat protective covering comprises at least two concentric and cylindrical plate layers, which are fixedly mounted at regular intervals around and at a distance from the barrel, and that at least one row of holes is formed at most a short distance in the circumferential direction thereof from and parallel to the upper and the lower line of generatrix, respectively, of each plate layer.

5,062,347

TRUNNION ASSEMBLY

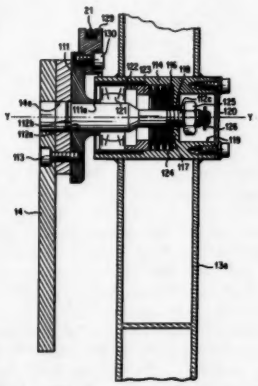
Jean-Philippe P. B. Allais, Montivilliers; Alain R. Guillermond, Epouville, and Pascal G. Rouyer, Le Havre, all of France, assignors to Societe Anonyme Dite Hispano Suiza, Saint Cloud Cedex, France

Filed Aug. 2, 1990, Ser. No. 561,867

Claims priority, application France, Aug. 10, 1989, 89 10764

Int. Cl.[5] F41A *27/08, 23/10*

U.S. Cl. 89—37.07 14 Claims



1. A trunnion assembly for pivotally supporting a weapon carrier on support member so as to pivot about a pivot axis comprising:

a) a pivot pin having a longitudinal axis defining the pivot axis;

b) a support member;

c) bearing means attached to the pivot pin such that the pivot pin may pivot about the pivot axis;

d) mounting means slidably mounting the bearing means to the support member such that the bearing means is movable along the axis about which the pivot pin pivots;

e) resilient biasing means operatively interposed between the support member and the bearing means to exert a biasing force on the bearing means so as to bias the bearing means and the pivot pin in a first axial direction along the axis about which the pivot pin pivots; and,

f) means operatively interposed between the pivot pin and the support member to overcome the biasing force of the resilient biasing means and move the pivot pin and the bearing means in a second axial direction along the axis about which the pivot pin pivots generally opposite to the first axial direction.

5,062,348

SEAL UNIT FOR BRAKE BOOSTER

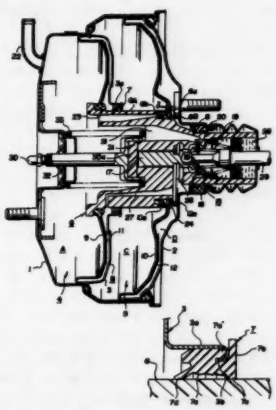
Hiroya Gotoh, and Kazuo Kobayashi, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1990, Ser. No. 567,912

Claims priority, application Japan, Aug. 31, 1989, 1-102617[U]

Int. Cl.[5] F15B *9/10*; F01B *19/00*

U.S. Cl. 91—369.2 9 Claims



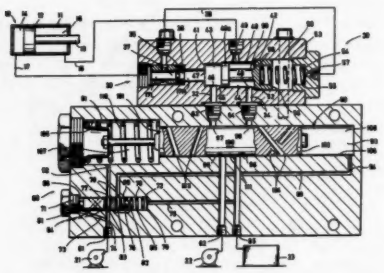
1. In a brake booster including a center plate disposed within a shell to divide its interior into a front chamber and a rear chamber, a valve body slidably extending through the center plate, annular seal means for maintaining a hermetic seal between the center plate and the valve body, a pair of power pistons disposed within respective chambers and connected to the valve body, and a pair of diaphragms applied to the back surfaces of the respective power pistons to divide each chamber into a constant pressure chamber and a variable pressure chamber; the improvement wherein said center plate includes a central, axially extending cylindrical portion, an end of the cylindrical portion being folded back radially inwardly to form a generally axially opening U-shaped fold, said U-shaped fold including a pair of radially spaced and generally axially extending leg portions which are connected by a generally radially extending bight portion, said axially extending cylindrical portion defining one of said leg portions, the annular seal means being fitted inside the cylindrical portion and confined radially between said cylindrical portion and said valve body, and a part of said annular seal means being disposed radially between said leg portions of the fold.

5,062,349

FLUID ECONOMIZER CONTROL VALVE SYSTEM FOR BLOWOUT PREVENTERS

Farooq A. Khan, Yorba Linda, Calif., assignor to Baroid Technology, Inc., Houston, Tex.

Filed Mar. 19, 1990, Ser. No. 495,490
Int. Cl.[5] F15B *11/16*
U.S. Cl. 91—436 10 Claims



1. A flow pressure sensing control valve system for use with blowout preventers having an operator piston and cylinder for opening and closing a blowout preventer, said piston and cylinder having a closing side and an opening side, said closing side having a greater effective surface area than said opening side, said system comprising:

a sensing means for creating a pressure drop in the flow directed to said closing side relatively with increases in flow velocity wherein said sensing means has a high side and a low side, said low side communicating with said closing side of said operator cylinder and said high side communicating with a pressurized fluid source; and

a fluid return system, comprising,

a directional flow control system for selectively directing flow from said opening side of said operator piston alternatively to said closing side of said operator piston when the drop in pressure across said sensing means is greater than a preselected value or to a discharge point when said pressure drop is less than said preselected value, said directional flow control system, comprising,

a control cylinder having a bore with an inner diameter, a substantially open return end and a substantially closed retracting end, said retracting end being in communication with said pressurized fluid source and further having a retracting aperture proximate to said retracting end, a return aperture proximate to said return end and a mid-aperture located along the length of said control cylinder and in communication with said opening side of said actuating cylinder; and

a control piston slidably mounted in said control cylinder for longitudinal movement, said piston having a configuration which snugly fits the inner diameter of said control cylinder and a longitudinal width which accommodates the communication of fluid from said opening side of said operator cylinder with said closing side of said operator cylinder when said control piston is at the return end of the flow routing cylinder and wherein discharge of fluid from said opening side of said operator cylinder is accommodated when said control piston is adjacent to said retracting end; and

a pressure switching system in communication with said directional flow control system for selectively varying the alternative flow paths of said directional flow control system, said switching system, comprising,

a switching cylinder having a discharge end in communication with said control cylinder, a feedback end in communication with said low side of said sensing means, and a longitudinal bore of diameter slightly greater than said inner diameter of said control cylinder;

a switching cylinder piston slidably mounted in said switching cylinder for longitudinal movement having an effective surface area slightly greater than the effective surface area of said control cylinder piston so that, upon closing of said operator cylinder, flow from said low side of said sensing means moves said switching cylinder piston to a discharge end when said pressure drop across said sensing means is below said preselected value and further having a configuration which snugly fits said inner diameter of said bore of said switching cylinder; and

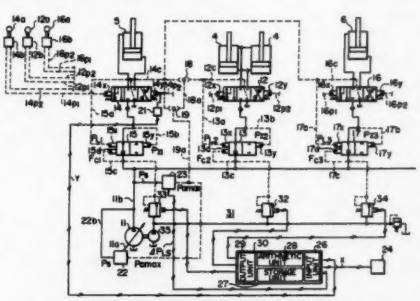
a switching rod positioned between said switching cylinder piston and said control piston, said rod having outer radial dimensions smaller than said inner diameter of said control cylinder and a location between said two pistons so that said switching rod can pass into said control cylinder to push said control piston to said retracted end upon movement of said switching cylinder piston to said discharge end and so that fluid may pass around said switching rod and through said control cylinder when said control piston is adjacent said retracting end of said control cylinder.

5,062,350

HYDRAULIC DRIVE SYSTEM FOR CIVIL ENGINEERING AND CONSTRUCTION MACHINE

Hideaki Tanaka, Tsuchiura; Toichi Hirata, Ushiku; Genroku Sugiyama, Ibaraki; Masakazu Haga, Ibaraki, and Yusuke Kajita, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00375, § 371 Date Jul. 12, 1990, § 102(e) Date Jul. 12, 1990, PCT Pub. No. WO90/11413, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 29, 1990, Ser. No. 536,545
Claims priority, application Japan, Mar. 22, 1989, 1-67620
Int. Cl.[5] F15B *11/08*
U.S. Cl. 91—448 9 Claims



1. A hydraulic drive system for a civil engineering and construction machine comprising a hydraulic pump, a plurality of actuators driven by a hydraulic fluid supplied from said hydraulic pump and including an arm cylinder and a boom cylinder, a plurality of flow control valves for controlling flows of the hydraulic fluid supplied to said respective actuators and including an arm directional control valve and a boom directional control valve, and a plurality of distribution compensating valves for controlling differential pressures across said respective flow control valves, said distribution compensating valves each having drive means to set a target value of the differential pressure across the associated flow control valve, said hydraulic drive system further comprising:

first means for detecting an arm crowding operation performed by driving of said arm cylinder, and

second means for controlling said drive means of the distribution compensating valve associated with said arm cylinder so as to reduce at least the target value of the differen-

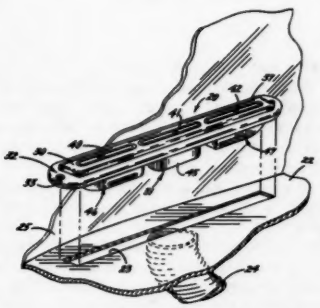
tial pressure across the associated flow control valve, when the arm crowding operation is detected.

5,062,351

AIR DIFFUSER FOR A MOTOR VEHICLE

John M. Kloster, Caledonia, Ill., assignor to Atwood Industries, Inc., Rockford, Ill.

Filed Sep. 27, 1990, Ser. No. 589,190
Int. Cl.[5] B60S *1/54*
U.S. Cl. 98—2.09 7 Claims



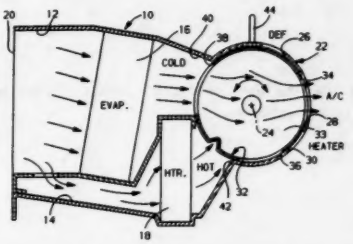
1. A diffuser for receiving conditioned air from supply hose means and for distributing such air upwardly toward and laterally across the windshield of a motor vehicle, said diffuser being molded of plastic and being formed with a laterally elongated hollow body having an upper portion and a lower portion, a laterally elongated and horizontally disposed mounting flange extending around the outer periphery of said body and having a lower side located between the upper and lower portions of the body, said upper portion of said body comprising a laterally elongated and horizontally disposed top plate, three laterally spaced and laterally elongated outlet slots formed vertically through said top plate, one of said slots being a center slot and the other two of said slots being first and second outboard slots spaced laterally from opposite ends of said center slot, the lower portion of said body comprising (A) a vertically extending inlet sleeve disposed in registry with said center slot and adapted for connection to said supply hose means, (B) first and second pods disposed in registry with said first and second outboard slots, respectively, and spaced laterally from said sleeve, each of said pods being defined by a bottom wall located a predetermined distance below said flange, by a pair of laterally extending side walls extending upwardly from said bottom wall to the lower side of said flange, by an outboard end wall extending upwardly from said bottom wall to the lower side of said flange at the outboard ends of said side walls, and by an inboard end wall extending upwardly from said bottom wall at the inboard ends of said side walls and terminating short of the lower side of said flange, and (C) first and second channels extending laterally between said sleeve and said first and second pods, respectively, to establish communication from said sleeve to said pods, the depth and volume of each channel being substantially less than the depth and volume of the respective pod whereby said pods define static regain chambers to promote substantially uniform distribution of air through the three slots.

5,062,352

MOTOR VEHICLE HEATING, VENTILATING AND AIR CONDITIONING SYSTEM WITH COMBINED MODE/TEMPERATURE DOOR

James C. Ostrand, Armada, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 16, 1990, Ser. No. 552,630
Int. Cl.[5] B60H *1/26*
U.S. Cl. 98—2.08 3 Claims



1. A motor vehicle passenger compartment heating, ventilating and air conditioning system comprising an air duct having an inlet at one end and a defroster outlet, air conditioning outlet and heater outlet at another end, said air duct having parallel arranged first and second passages for connecting said outlets to said inlet, an evaporator mounted n said first passage, a heater mounted in said second passage, and singular mode/-temperature door means mounted in said duct between said passages and outlets for (1) fully opening said first passage and air conditioning outlet while closing said defroster outlet, heater outlet and second passage to effect within said door means a first mode providing full cold operation, (2) fully opening said first passage while partially opening said air conditioning outlet and second passage and closing said defroster outlet and heater outlet to effect within said door means a second mode providing mixed hot and cold operation, (3) fully opening said first passage while partially opening said second passage, air conditioning outlet and heater outlet and closing said defroster outlet to effect within said door means a third mode providing bi-level mixed hot and cold operation, (4) fully opening said second passage and heater outlet while closing said first passage and air conditioning outlet and partially opening said defroster outlet to effect within said door means a fourth mode providing full hot heater/defroster operation, and (5) fully opening said second passage while partially opening said defroster outlet and heater outlet and closing said first passage and air conditioning outlet to effect within said door means a fifth mode providing full hot heater and defroster bleed operation.

5,062,353

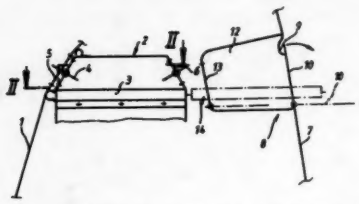
HEATING OR AIR CONDITIONING EQUIPMENT FOR THE PASSENGER COMPARTMENT OF A MOTOR VEHICLE

Klaus Arold, Sindelfingen, and Ulrich Bruhnke, Ehningen, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Feb. 4, 1991, Ser. No. 650,000
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1990, 4004501
Int. Cl.[5] B60H *3/06*
U.S. Cl. 98—2.11 4 Claims

1. Heating or air conditioning equipment for the passenger compartment of a motor vehicle, which equipment is connected to the bulkhead on the passenger compartment side, is covered by a dashboard provided with a glove compartment and has an air filter located on the air inlet side, which air filter is designed in particular as a dust filter, wherein the air filter is aligned at least approximately horizontally and is adjacent to

the insert of the glove compartment, and wherein the air filter can be inserted and removed through the glove compartment



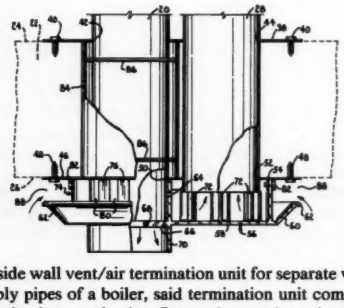
opening after the insert or a partial region of it has been removed or pivoted away.

5,062,354

SIDE WALL VENT/AIR TERMINATION UNIT FOR BOILERS

James V. Goins; Robert B. Duggan; William J. Pier, all of Michigan City, and Roger Wienhoft, LaPorte, all of Ind., assignors to The Marley Company, Mission Woods, Kans.

Filed Dec. 3, 1990, Ser. No. 620,566
Int. Cl.[5] F23L *17/04*
U.S. Cl. 98—62 **17 Claims**



1. A side wall vent/air termination unit for separate vent and air supply pipes of a boiler, said termination unit comprising:

a termination cap having first and second portions for receiving ends of the vent pipe and air supply pipe, respectively, when the pipes are extended through the side wall;

means for mounting said termination cap on said side wall on an exterior surface thereof;

a face plate on said termination cap at an exposed location spaced outwardly from said exterior surface when the termination cap is mounted on the side wall;

said face plate having a vent opening therethrough aligned with said vent pipe to vent through the face plate exhaust gases from the boiler which flow through the vent pipe;

said termination cap having a termination cap wall which extends around said first and second portions and within which the end of the air supply pipe is situated with said end of the supply pipe exposed to receive incoming air; and

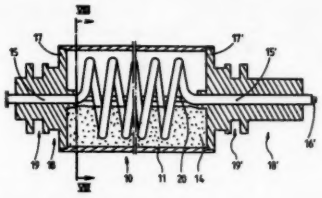
a plurality of air intake openings in said termination cap wall for receiving incoming air supplied to the supply pipe.

5,062,355

RUN-THROUGH GRILL WITH NON-UNIFORM HEAT DISTRIBUTION ABOUT THE ROLL SURFACE

Hansdieter Greiwe, Boxberg, Fed. Rep. of Germany, assignor to Patzner GmbH & Co., Bad Mergentheim, Fed. Rep. of Germany

Continuation of Ser. No. 301,232, Jan. 24, 1989, abandoned. This application Apr. 18, 1990, Ser. No. 510,527
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802345
Int. Cl.[5] A47J *37/06*; B21B *27/06*
U.S. Cl. 99—349 **7 Claims**



1. A run-through grill comprising:

at least two rolls mounted in parallel for rotation about a horizontal axis, and forming a gap therebetween, for downwardly introducing a piece of meat into said gap, each of said at least two rolls comprising:

(a) a helical heating coil;

(b) a jacket surrounding said helical heating coil so as to provide a cavity between the heating coil and the jacket;

(c) a fluidly movable particulate filling material in a quantity so as to continually provide for heat-transferring contact between a lower part of the heating coil and a lower part of the jacket through said particulate filling material and heat-transfer between an upper part of the heating coil and an upper part of the jacket through heat-radiation; and

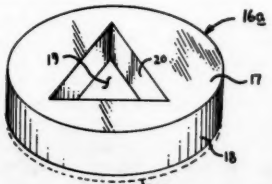
(d) a circumferential non-uniform heat distribution over the jacket being provided such that said upper part of said jacket out of contact with said particulate filling material is heated to a higher temperature than said lower part of said jacket in contact with said filling material.

5,062,356

COOKIE BAKING APPARATUS

Armella Frankowski, 18911 Townline Rd., Mokena, Ill. 60448

Filed Nov. 5, 1990, Ser. No. 610,161
Int. Cl.[5] A22C *7/00*; A23P *1/00*
U.S. Cl. 99—428 **1 Claim**



1. A cookie baking apparatus comprising, in combination,

an elongated continuous planar metallic support plate, the metallic support plate including a perimeter flange extending peripherally about the support plate in a fixed relationship, and

a plurality of mold members securable to the support plate for effecting severing of discrete cookie portions from a dough sheet, and

wherein each of the mold members include a top plate, the top plate includes a downwardly extending continuous skirt orthogonally mounted to an outer periphery of the top plate, and a dough ejecting opening directed through the top plate medially thereof, and a continuous opening skirt fixedly and orthogonally mounted coextensively to the top plate to an inner periphery thereof defining the dough ejecting opening, wherein the opening skirt and the continuous skirt are of equal predetermined height, and

wherein a lower terminal end of the continuous skirt includes a continuous ferromagnetic strip to enhance securement of the opening skirt to the support plate during a dough severing procedure.

5,062,357

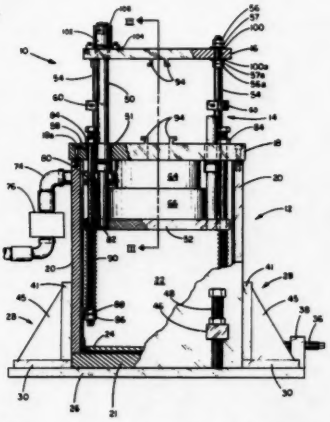
PNEUMATIC PRESS

Robert B. Senior, Holland, and Edward L. Hvizdos, Fruitport, both of Mich., assignors to Innovated, Inc., Holland, Mich.

Filed Apr. 25, 1990, Ser. No. 514,672

Int. Cl.[5] B30B *15/16, 1/00*

U.S. Cl. 100—53 **25 Claims**



1. A fluid-operated press for continual stamping comprising:

a bed plate having an aperture, a discharge hole, a first surface, and a second surface opposite the first surface;

a press plate spaced from the first surface and defining a die-set area therewith;

spring means biasing the press plate away from the first surface;

pneumatically operated means for urging the press plate toward the first surface, said pneumatically operated means including a piston mounted to the second surface and a cylinder telescopically received over the piston for reciprocating movement relative thereto;

said piston having an inclined groove in communication with the discharge hole, said groove sloping away from the discharge hole radially of the piston; and

link means connecting the cylinder to the press plate, said link means comprising a rod connected at one end to the press plate and at another end to the cylinder, said rod extending through the aperture, whereby upon introduction and exhaust of pressurized fluid to the cylinder, the cylinder is thereby urged away from and toward, respectively, the second surface, and the press plate is urged toward and away from, respectively, the first surface to repetitively compress a die set positioned in the die-set area.

5,062,358

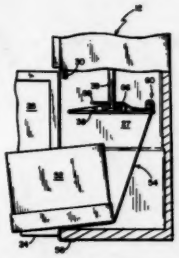
BALE EJECTOR FOR A TRASH COMPACTOR

Anthony Fox, Bloomington, Minn., assignor to Marcella M. Fox, Bloomington, Minn.

Continuation-in-part of Ser. No. 405,272, Sep. 11, 1989, abandoned, which is a continuation-in-part of Ser. No. 357,091, May 25, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 606,907

Int. Cl.[5] B30B *15/32*

U.S. Cl. 100—218 **12 Claims**



1. In a refuse compaction apparatus of the type including an upright rectangular cabinet having a compaction chamber at the base of said cabinet and having a rear side wall and a compaction plate disposed within said cabinet for vertical, reciprocating displacement and an ejection means for facilitating the removal of compacted refuse from said cabinet, said ejection means including an elongated flexible band, having a first end anchored to the front edge of said base of said cabinet and extending across said base and up said rear side wall of said cabinet to a second end which, when tensioned, causes displacement of the compacted refuse, the improvement comprising:

(a) band take-up means coupled to said second end of said elongated flexible band for reeling and unreeling said band as said compaction plate moves downward and upward, respectively, within said cabinet;

(b) a locking means coupled to said band take-up means for preventing the unreeling of said elongated flexible band upon upward movement of said compaction plate to thereby tension said band to lift and rotate said refuse from said compaction chamber.

5,062,359

INTAGLIO PRINTING MACHINE FOR THE PRINTING OF CURRENCY PAPERS

Gualtiero Giori, Lonay, Switzerland, assignor to De La Rue Giorgi S.A., Lausanne, Switzerland

Filed May 3, 1990, Ser. No. 518,146

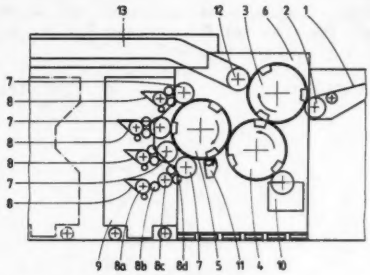
Claims priority, application Switzerland, Jun. 29, 1989, 2422/89

Int. Cl.[5] B41F *9/02*

U.S. Cl. 101—152 **9 Claims**

1. A sheetfed or webfed intaglio printing machine for currency papers, especially bank notes, comprising: a plate cylinder (4) with several printing plates, and impression cylinder (3), a wiping device (10) and an inking system consisting of a collector inking cylinder (5) having an elastic surface interacting with the printing plates, selective color inking cylinders (7) having reliefs corresponding to the colored zones to be printed in different colors and in contact with the periphery of the collector inking cylinder (5), and a separate inking device (8) associated with each selective color inking cylinder (7), wherein the diameter of the collector inking cylinder (5) is equal to N times the diameter of the plate cylinder (4), N being an integer ranging from 1 to 3; wherein the printing plates are equipped with intaglio cuts representing the elements of a main design and with less deep and finer intaglio cuts representing the elements of a safety background, and wherein at least one

selective color inking cylinder transfers by direct contact the ink to the collector inking cylinder (5) in order to ink the intaglio cuts representing the main design, while the other



selective color inking cylinders transfer by direct contact the ink to the collector inking cylinder (5) in order to ink the intaglio cuts representing the multicolor safety background.

5,062,360

COMBINED ROTARY WEB-FED PRINTING MACHINE, ESPECIALLY FOR THE PRINTING OF SECURITIES

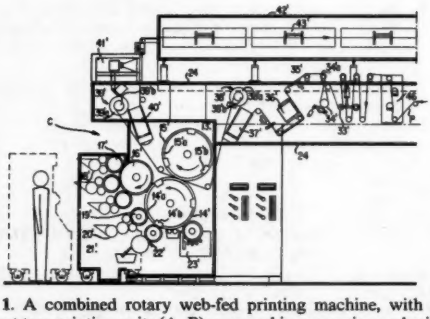
Albrecht J. Germann; Hans B. Bolza-Schünemann; Johannes G. Schaede, all of Wuerzburg, and Joachim A. H. Lapp, Margetshochheim, all of Fed. Rep. of Germany, assignors to De La Rue Giori S.A., Lausanne, Switzerland

Filed Aug. 1, 1990, Ser. No. 561,698

Claims priority, application Switzerland, Aug. 30, 1989, 03148/89

Int. Cl.[5] B41F *5/16, 9/02, 11/00*

U.S. Cl. 101—152 **16 Claims**



1. A combined rotary web-fed printing machine, with at least two printing units (A, B) arranged in succession and with a transport device conveying the paper in the form of a web (P) through the printing units and equipped with continuously driven draw-roller arrangements (27, 34, 34'), wherein the printing units (A, B) have respective cylinders (2, 3; 14, 15), including printing and impression cylinders forming the printing nip, each cylinder having a plurality of sectors separated by cylinder pits, wherein, as seen in a transport direction, the transport device possesses, in front of the printing nip of each printing unit (A, B), a first paper-web store (29; 37) and a following intermittently controllable first draw-roller unit (30; 38) and, after the printing nip of each printing unit (A, B), an intermittently controllable second draw-roller unit (31; 39) and a following second paper-web store (32; 40); control means including a regulating and control system for said first and second draw-roller units; said control system including individually regulated drives for each said draw-roller unit and means for intermittently controlling said draw-roller units for forward and backward movement of the web by said individually regulated drives for performing register and printing length correction, and wherein at least one of said continuously driven draw-roller arrangements (27, 34, 34') is installed respectively in front of the first paper-web store (29) of the first printing unit (A), between the second paper-web store (32) of the first printing unit and the first paper-web store (37) of the second printing unit (B), and behind the second paper-web store (40) of the second printing unit, in such a way that the paper web is transported uniformly in front of the first paper-web store of the second printing unit, behind the second paper-web store of the second printing unit, and between the two printing units (A, B), within a portion limited by the respective paper-web stores (32, 37).

5,062,361

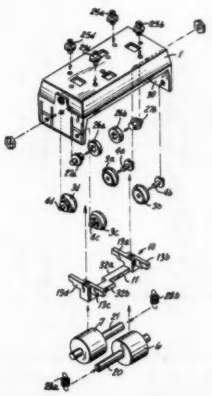
CREDIT CARD IMPRINTER WITH ONE-PIECE SLIDER

Mikhail Kabelsky, New York, N.Y., assignor to Bartizan Corporation, Yonkers, N.Y.

Filed Jul. 23, 1990, Ser. No. 557,406

Int. Cl.[5] B41F *3/04*

U.S. Cl. 101—269 **4 Claims**



1. A credit card imprinter including a base member having a flat top face, means to locate at least one embossed card on said top face, a carriage slidingly connected to said base member and adapted to be hand-pulled over said top face in a reciprocal motion, first and second cam means positioned on said base member, first and second axles within said carriage, a first platen roller mounted on said first axle and a second platen roller mounted on said second axle; each of said axles and the rollers carried thereon having a raised idle position and a lowered imprinting position; and a slider means to shift said axles alternatively from said idle to said imprinting position; said slider means comprising a one-piece unitary member having a central portion with an imaginary median line therethrough, a front face and a rear face, four arm portions extending outwardly from the central portion with two arms extending outwardly on each side of said median line; each of said arm portions having a bottom surface which abuts an axle and positions the height position of the axle, each of said bottom surfaces having an upper horizontal ledge portion, an inclined cam portion and a lower horizontal ledge portion; wherein said first and second base cam means contact said slider front face and rear face, respectively, to shift said slider.

5,062,362

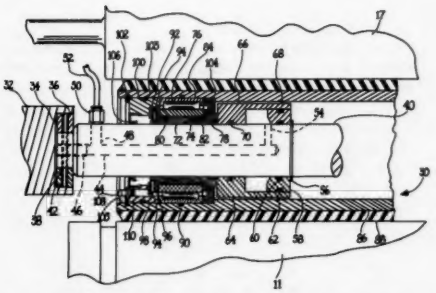
OSCILLATING PRINTING PRESS ROLLER HAVING A PLURALITY OF SEPARATE ANNULAR PISTONS

James R. Kemp, Hurst, Tex., assignor to Advanced Graphics Technologies, Inc., Grapevine, Tex.

Continuation of Ser. No. 255,153, Oct. 7, 1988, abandoned. This application Feb. 4, 1991, Ser. No. 651,747

Int. Cl.[5] B41F *31/14, 7/26*

U.S. Cl. 101—348 25 Claims



1. An oscillating roller for one of the ink and dampening fluid systems of a printing press, comprising an elongated axially extending roller shaft having two opposed outer ends, means on said outer ends of said roller shaft for mounting said roller shaft to a printing press, a plurality of annular cylinder heads located on and concentric with said roller shaft, said annular cylinder heads being axially spaced apart along said roller shaft, at least one of said annular cylinder heads being located adjacent each of said outer ends of said roller shaft, a plurality of separate annular pistons relatively non-rotatably mounted and relatively slidable on and concentric with said roller shaft, said plurality of separate annular pistons being axially spaced apart along said roller shaft, at least one of said separate annular pistons being located adjacent each of said outer ends of said roller shaft, a plurality of annular cylinder walls axially spaced apart along said roller shaft between said annular cylinder heads and said separate annular pistons, each of said separate annular pistons sliding in the adjacent said annular cylinder wall, said roller shaft extending through each of said pluralities of annular cylinder heads, separate annular pistons and annular cylinder walls, said pluralities of annular cylinder heads, separate annular pistons and annular cylinder walls cooperating to form a plurality of annular axially variable volumes about said roller shaft, at least one of said annular axially variable volumes being located adjacent each of said outer ends of said roller shaft, control means for admitting and exiting pressurized fluid from said plurality of annular axially variable volumes for causing axial oscillating motion of said plurality of separate annular pistons relative to said plurality of annular cylinder heads, a hollow roller core, said outer ends of said roller shaft extending beyond said hollow roller core, said pluralities of separate annular pistons, annular cylinder heads and annular cylinder walls being contained beneath said hollow roller core, said hollow roller core being spaced radially outwardly apart from each of said plurality of annular cylinder walls, and means for axially moving said hollow roller core with one of said plurality of annular cylinder walls and plurality of separate annular pistons, whereby operating said control means to admit and exit pressurized fluid from said plurality of annular axial variable volumes causes axial oscillating motion of said hollow roller core relative to said roller shaft.

5,062,363

FLEXIBLE PRINTING PLATE ATTACHMENT SYSTEM

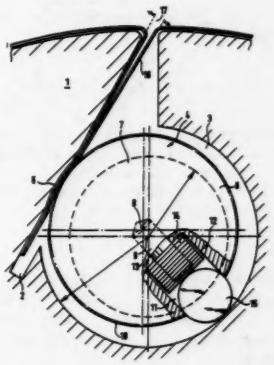
Klaus T. Reichel, Augsburg, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Jan. 14, 1991, Ser. No. 640,688

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1990, 4005093

Int. Cl.[5] B41F *1/28, 21/00*

U.S. Cl. 101—415.1 7 Claims



1. Flexible printing plate attachment system having

a plate cylinder (1) formed with a clamping groove (2, 3) for placement of end portions of a flexible printing plate (16) therein,

wherein, in accordance with the invention,

the clamping groove includes a cylindrical opening (3) extending axially in the cylinder (1), and an insertion channel (2) defining a channel wall (5), said channel wall intersecting the cylindrical opening at a tangential region thereof; and

wherein an eccentrically retained spindle (4) is located in said cylindrical opening (3) and positioned for engagement against said end portions of the flexible printing form (16) and, selectively, to press the end portion against said channel wall upon rotation of said eccentrically retained spindle within the cylindrical opening, wherein said channel wall has a part-cylindrical portion which forms a portion of the circumferential circle of said cylindrical opening.

5,062,364

PLASMA-JET IMAGING METHOD

Thomas E. Lewis, E. Hampstead; Richard A. Williams, Hampstead; John P. Gardiner, Londonderry, and John F. Kline, Hudson, all of N.H., assignors to Presstek, Inc., Hudson, N.H.

Continuation of Ser. No. 329,979, Mar. 29, 1989, Published Application No.

Int. Cl.[5] B41C *1/05, 1/10*

U.S. Cl. 101—467 16 Claims

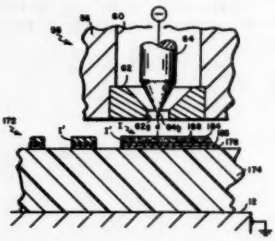
5. A method imaging a lithographic plate having a printing surface and including a metal layer and a second layer underlying said metal layer, said metal and second layers having different affinities for a printing liquid selected from the group consisting of water and ink, said method comprising the steps of:

spacing a plasma-jet discharge source opposite and close to the printing surface; and

without contacting said printing surface, exposing the metal layer to ionized plasma discharges from said plasma-jet discharge source at selected points thereon to remove said

metal layer and expose said second layer at the selected points.

spacing a plasma-jet discharge source opposite and close to the printing surface; and



without contacting said printing surface, exposing the first and second layers to ionized plasma discharges from said plasma-jet discharge source at selected points thereon to remove said first and second layers at the selected points, thereby exposing said third layer.

5,062,365

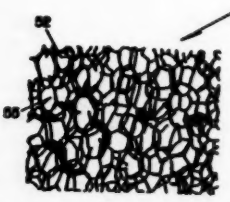
RAPID BURNING PROPELLENT CHARGE FOR AUTOMOBILE AIR BAG INFLATORS, ROCKET MOTORS, AND IGNITERS THEREFOR

J. B. Canterberry, Taft, Tenn., assignors to Thiokol Corporation, Ogden, Utah

Division of Ser. No. 158,829, Feb. 11, 1988, Pat. No. 5,024,160, which is a division of Ser. No. 908,763, Sep. 18, 1986, Pat. No. 4,798,142. This application Oct. 1, 1990, Ser. No. 591,406

Int. Cl.[5] F42B *3/00, 15/10*

U.S. Cl. 102—322 **11 Claims**



1. An igniter comprises a gas generant charge including a reticulated substrate having a network of interconnected ligaments and a coating of solid gas generant composition on said ligaments, said solid gas generant composition being interconnected in the form of a network, said coating has a thickness such that interstices are between coated ligaments which interstices define open gas generant surface area for supporting combustion, said interconnected ligaments defining voids which are open to each other so that the gas generant may constitute a single mass.

5,062,366

TEMPERATURE COMPENSATING CONTROL SYSTEM FOR ADJUSTING PRIMARY PROPELLANT CHAMBER VOLUME

Calvin T. Candland, Eden Prairie; Kim L. Christianson, Maple Grove; James L. Kennedy, Bloomington; David A. Smith, St. Paul; Francis J. Nosan, Brooklyn Park, and Steven F. Overend, New Hope, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 7, 1989, Ser. No. 389,939

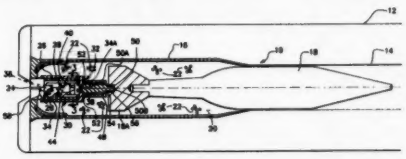
Int. Cl.[5] F42B *5/02*

U.S. Cl. 102—430 **23 Claims**

1. A temperature compensating control system for adjusting the volume of a chamber in an ammunition round which communicates with a projectile and contains a propellant having temperature dependent performance characteristics, said control system comprising:

(a) a control tube housing;

(b) a piston assembly slidably mounted relative to said housing for movement through a drive stroke and being drivingly coupled to a trailing end of the projectile; and



(c) means responsive to the temperature of the ammunition round for adjusting the length of the drive stroke of said piston assembly in proportion to the temperature and thereby adjusting the position of the projectile and said volume of the chamber in proportion to the temperature of the ammunition round; and

(d) means for stopping the piston in response to the temperature of the ammunition round at an adjusted position prior to firing the round.

5,062,367

AIR BAG INFLATION GAS GENERATOR

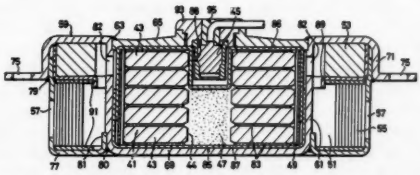
Minoru Hayashi; Mitoshi Matsufuji; Sakae Takahashi, all of Shirakawa; Koichi Kamiji, Wako; Kouichi Kobari, Shirakawa; Junichi Kishimoto, Shirakawa; Michio Shioda, Shirakawa, and Masaaki Kawaguchi, Wako, all of Japan, assignors to Nippon Koki, Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1989, Ser. No. 444,706

Claims priority, application Japan, Dec. 5, 1988, 63-309091; Dec. 5, 1988, 63-309092; Dec. 5, 1988, 63-309094

Int. Cl.[5] C06D *5/00;* **F42B** *3/04*

U.S. Cl. 102—530 **8 Claims**



1. As air bag inflation gas generator comprising a combustion chamber containing a gas generating agent, an igniter and an ignition agent arranged in the center of said combustion chamber to burn said gas generating agent, a combustion chamber filter arranged along an inner wall of said combustion chamber, a plenum chamber annularly surrounding and communicating with said combustion chamber to receive gas flow from said combustion chamber filter, a plenum chamber filter contained in said plenum chamber, and gas outlets provided with said plenum chamber to feed the gas flow from said plenum chamber filter to an air bag, wherein:

said combustion chamber comprises a one-piece bottom-closed cylinder of a housing body and a lid welded to seal the opening of said bottom-closed cylinder, said lid receiving said igniter,

said housing body comprises a flange extending outward and formed integrally, in one-piece, with the opening of said bottom-closed cylinder, and an external cylinder formed on the periphery of said flange and bent toward the bottom of said housing body,

said plenum chamber is formed by covering said external

and bottom-closed cylinders with a covering member from the bottom of said housing body, and

said covering member is welded to said external and bottom-closed cylinders.

5,062,368

ASSEMBLY LINE FOR WORKING AND MOUNTING STRUCTURAL PARTS

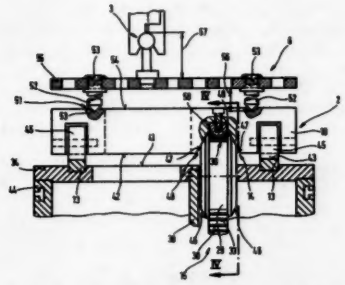
Walter Sticht, Attnang-Puchheim, and Roland Heiml, Vöcklamarkt, both of Austria, assignors to STIWA-Gertigungstechnik Sticht Gesellschaft m.b.H., Attnang-Puchheim, Austria

Filed Mar. 8, 1990, Ser. No. 490,391

Claims priority, application Austria, Mar. 8, 1989, 530/89

Int. Cl.[5] B61J *3/04*

U.S. Cl. 104—172.3 **11 Claims**



1. A production plant for processing or assembling components transported on workpiece carriers in a conveying direction along a succession of adjacent guide sections, each guide section comprising two vertical guides defining a conveying plane for the workpiece carriers, the vertical guides extending in the conveying direction and being spaced from each other transversely to the conveying direction, and an independent feed device in each guide section for driving the workpiece carriers in the conveying direction, the feed devices beign independent of each other and of the vertical guides in each guide section, each feed device comprising

(a) a toothed driving belt extending parallel to the conveying plane in the conveying direction,

(b) two deflection rollers spaced from each other in the conveying direction and extending perpendicularly to the conveying plane, the toothed belt being trained over the deflection rollers and being vertically and laterally guided thereby, and each deflection roller including

(1) respective circumferential lateral guide faces directed transversely in opposite directions, and

(c) a drive motor arranged to drive the toothed driving belt about the deflection rollers, and

(d) the workpiece carriers including

(1) respective lateral guide faces engaged by the lateral guide faces of the deflection rollers whereby the engaging lateral guide faces of the deflection rollers and the workpiece carriers provide a lateral guide for the workpiece carriers, and

(2) a rack engaging the toothed belt whereby the toothed belt drives the workpiece carriers upon being driven by the drive motor.

5,062,369

FRAME STRUCTURE

Ronald C. Cobden, Pinner, and Alan J. Shiels, Hazlemere, both of Great Britain, assignors to British Alcan Aluminium PLC, Buckinghamshire, England

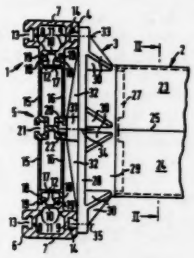
PCT No. PCT/GB89/01264, § 371 Date Jul. 17, 1990, § 102(e) Date Jul. 17, 1990, PCT Pub. No. WO90/04534, PCT Pub. Date May 3, 1990

PCT Filed Oct. 20, 1989, Ser. No. 543,777

Claims priority, application United Kingdom, Oct. 21, 1988, 8824765

Int. Cl.[5] B62D *21/12*; B61D *17/00*

U.S. Cl. 105—396 **10 Claims**



1. A frame structure of aluminium alloy having a pair of spaced apart side rails and a plurality of spaced apart cross-members each comprising a central tubular portion and extending between the side rails, characterised in that at least over a major part of its length each side rail comprises at least three hollow extrusions welded together at positions of low stress and has more than two longitudinally extending re-entrant, slots opening inwardly thereof at selected low stress locations thereon to receive the heads of bolts and in that an end plate formation is welded to each end of the tubular formations, said bolts engaging through apertures in the associated end plates to removably secure together the side rails and the cross-members only by said bolts at any desired location along said major part of the length of each side rail.

5,062,370

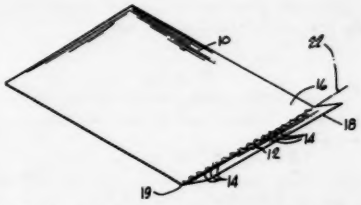
SLIP SHEET HAVING PERMANENTLY BENT PULL TAB AND METHOD OF MAKING THE SAME

Leon D. Etlinger, Aurora, Colo., assignor to Baron Industries, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 67,602, Jun. 29, 1987, abandoned. This application Jul. 3, 1990, Ser. No. 547,803

Int. Cl.[5] B65D *19/00*

U.S. Cl. 108—51.3 **9 Claims**



1. A slip sheet device for supporting and pulling a load positioned thereon onto the fork arms of a lift truck comprising:

a sheet of deformable plastic material having a flat main support portion;

a flap portion non-separably connected to said flat main support portion by an elongation transverse hinge portion providing a longitudinal pivotal axis enabling resilient

pivotal movement of said flap portion relative to said main support portion;

said flap portion being normally outwardly inclined relative to said main support portion;

said hinge portion comprising a uniform continuous pattern of equal size and equally spaced indentations formed in said plastic material; and

the indentations have triangular-shape flat unformed sheet portions therebetween.

5,062,371

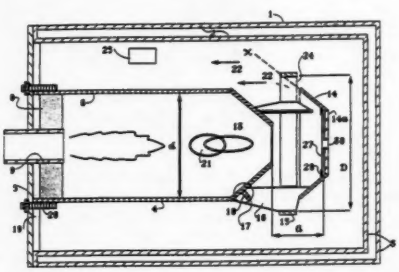
THERMAL REACTOR FOR HEATERS AND FUEL GENERATORS

Henri Lavorel, Sevrier, France, assignor to Efficient Thermal Reactors, Inc., Hyde Park, N.J.

Filed Feb. 12, 1990, Ser. No. 478,507

Int. Cl.[5] F23G *7/06*; F23J *15/00*

U.S. Cl. 110—214 **8 Claims**



1. A thermal reactor for enhancing combustion and reducing the emission of pollutants comprising:

a burner chamber bounded by (a cylindrical) an enclosure wall and a rear wall formed from refractory material and with a central opening for introducing gases of combustion;

a conical nose section, in the form of an inwardly diverging restriction, with the base of said nose section mounted on said enclosure wall at the open end thereof and the apex of said nose section formed with an exit orifice for said gases of combustion, on the end of said burner chamber;

(frusto conical shaped deflection) inwardly diverging restriction means spaced apart from and coextensive with said conical nose section directing said gases of combustion toward said nose section; and

means coaxial with said burner chamber positioned between said burner chamber and said restriction means for coupling said burner chamber and said restriction means, whereby prior to exiting said burner chamber said gases are places in turbulence, and after exiting said burner chamber said gases are reduced in velocity and change direction toward said burner chamber.

5,062,372

LINED HAZARDOUS WASTE INCINERATOR

Robert A. Ritter, 5108 Varscliff Road, NW., Calgary, Alberta, Canada T3A 0G3

Filed Oct. 24, 1990, Ser. No. 603,536

Claims priority, application Canada, Dec. 20, 1989, 2006139

Int. Cl.[5] F23G *5/00, 7/00*

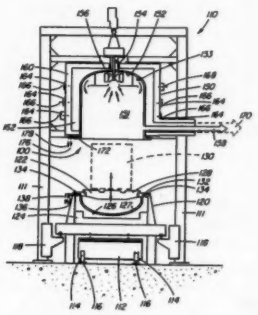
U.S. Cl. 110—242 **22 Claims**

1. A hazardous waste incinerator comprising:

(i) a sealed inner incineration chamber, which is either made from, or which is lined with, a non-porous, impervious, corrosion-resistant material, said incineration chamber including means for supporting hazardous waste to be incinerated, and a recirculating blower;

and

(ii) an insulated outer combustion chamber in sealed, spaced-apart relationship to said inner incineration chamber;



said outer combustion chamber always being out of communication with said inner incineration chamber.

5,062,373

BUTTON TRANSFERRING DEVICE

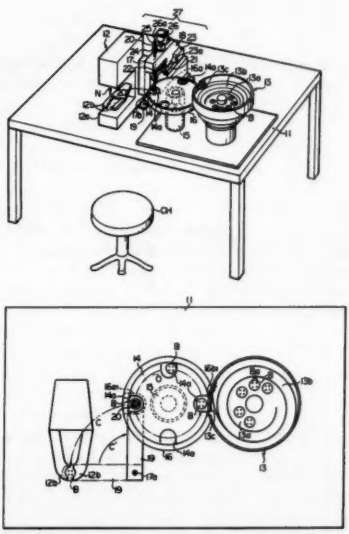
Maeno Kichizo; Junpei Arai, both of Tendou, and Hideo Aso, Chofu, all of Japan, assignors to Juki Corporation, Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 574,442

Claims priority, application Japan, Aug. 31, 1989, 1-226975; Sep. 18, 1989, 1-242875; Sep. 18, 1989, 1-242876; Sep. 18, 1989, 1-242883

Int. Cl.[5] D05B *3/22*; B65H *7/02*; B23Q *7/12*

U.S. Cl. 112—113 **9 Claims**



1. In a sewing apparatus having a button storage unit delivering buttons, one by one, to a sewing machine, a button transferring device for transferring a button from said storage unit to said sewing machine, comprising:

a button clamping device provided for clamping the button in a sewing position,

a rotary disk having a plurality of button insert holes,

a drive motor driving said rotary disk horizontally and intermittently,

a button receiving disk, positioned under said rotary disk, for receiving the button thereon, said receiving disk having a first button discharge hole communicating with said button insert holes of said rotary disk to discharge the button, and

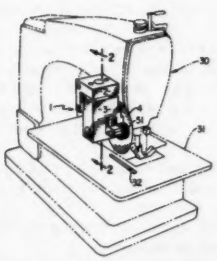
an arm horizontally moving between said button discharge hole and said button clamping device, said arm having a button holder at the tip end thereof for holding the button discharged rom said first button discharge hole.

5,062,374

ROTARY THREAD CUTTER FOR A SEWING MACHINE

Arthur C. Wokeck, Mauldin, and Theodore Opuszenski, Greenville, both of S.C., assignors to Clinton Industries, Inc., Carlstadt, N.J.

Filed Aug. 23, 1990, Ser. No. 572,051
Int. Cl.[5] D05B *37/04*
U.S. Cl. 112—130 **6 Claims**



1. A rotary cutter for a sewing machine having a mounting plate, said rotary cutter comprising:

a circular blade movable into engagement with an article to be cut;

means for rotating said circular blade;

a housing for supporting said rotating means; and

means for attaching said housing to the mounting plate for reciprocal movement relative thereto to provide for engagement of said circular blade with the article to be cut, said attaching means including a piston member fixedly connected to the mounting plate, said housing having a cylinder in which said piston member is located, and conduit means for supplying a pressure fluid alternatively to opposite sides of said piston member to effect reciprocal movement of said cylinder and thereby of said housing relative to said piston member.

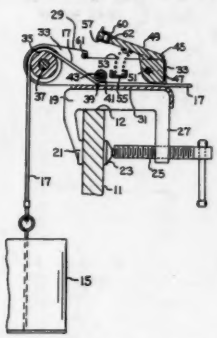
5,062,375

BOAT ANCHOR LINE CONTROL

James A. Makielski, 125 W. Marion, Apt. 222, South Bend, Ind. 46601

Filed Apr. 5, 1991, Ser. No. 680,839
Int. Cl.[5] B63B *21/22*
U.S. Cl. 114—210 **9 Claims**

1. A mechanism for controlling the extension of a boat anchor line from a boat; said mechanism comprising a c-shaped mounting means having opposed jaws engageable against opposite surfaces of a boat wall to rigidly position the mounting means on the wall; a trough structure supported on said mounting means; a pulley rotatably supported in said trough structure at one end thereof; and a spring-biased line gripper device supported in said trough structure at its other end; said mechanism being adapted to have a boat anchor line pass through the line gripper device, around the pulley and downwardly into the water; said line gripper device having a line-engageable clamp element normally holding the line in a fixed



condition relative to the trough structure, and a manually-operated handle for releasing said clamp element from the line.

5,062,376

ANCHORING DEVICE FOR LIGHT BOAT

Michel Tremblay, deceased, late of Val Bélair, Canada by Francine Paquet, heiress , assignor to Gestion A. et Y. Gilbert Inc., Québec, Canada

Filed Dec. 20, 1990, Ser. No. 631,149
Int. Cl.[5] B63B *21/50*
U.S. Cl. 114—230 **18 Claims**

1. An anchoring device comprising:

a frame;

a pair of winch drums and cables for attaching to anchors, said cables being wound into rolls on said drums for winding and unwinding in opposite directions;

means rotatably mounting said drums on said frame;

manually operable means on said drums and on said frame for rotating said drums and, in neutral position of said operable means, for allowing said drums to idle; and

manually releasable stopping means on said frame for stopping rotation of said drums to prevent said cables from unwinding therefrom, wherein said manually operable means comprise:

a first driven gear fixed to one of said drums and a second driven gear fixed to the other of said drums;

an operating shaft mounted for rotation and axial displacement on said frame and having a pair of pinions fixed thereto;

means controlling said axial displacement of said shaft between a first position wherein one of said pinions meshes with said first driven gear; a second position wherein both of said pinions are free of said gears; and a third position wherein the other of said pinions meshes with said second driven gear,

said operating shaft being formed with three spaced circumferential lock grooves,

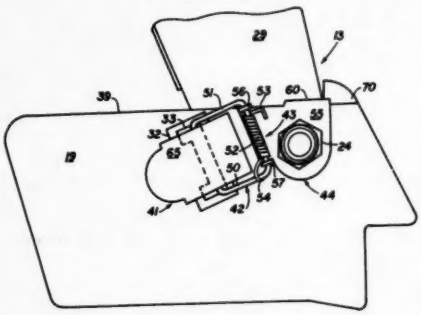
said control means comprising a ball lock including a spring-biased ball engageable in said grooves to hold said shaft selectively in any of said three positions.

5,062,377

POLE-LATCH ATTACHMENT FOR JET SKI

Randolph D. Miller, 14037 N. 41st St., Phoenix, Ariz. 85032

Filed Dec. 7, 1990, Ser. No. 623,518
Int. Cl.[5] B63B *35/73*
U.S. Cl. 114—270 3 Claims



1. An attachment for a motorized water ski, said ski including

a hull body,

motive power means mounted on said body for propelling said body through water,

a support member attached to said hull body and including at least one flange means, said flange means including an aperture formed therethrough,

an elongate steering handle extending outwardly from said body and having a distal end and a proximate end, said proximate end being attached to said flange means to permit movement of said handle between at least two operative positions,

a primary operative position, and

a secondary operative position with said distal end of said steering handle pivoted from said first operative position outwardly away from said hull body such that an object can be slid through said aperture and adjacent said steering handle, said attachment being operable to support said handle in said secondary operative position and prevent said handle from moving from said secondary to said primary operative position, said attachment comprising

(a) mounting means attached to one of the pair comprising

(i) said flange means, and

(ii) said hull body; and,

(b) spring loaded latching means attached to said mounting means and shaped and dimensioned to extend through said aperture when said handle is in said secondary operative position to prevent said handle from moving from said secondary operative position to said primary operative position, said latching means being movable between at least two operative positions,

(i) a first support operative position with said latching means extending through said aperture and adjacent said handle when said handle is in said secondary operative position to prevent said handle from moving from said secondary to said primary operative position, and

(ii) a second storage operative position with said latching means at least partially withdrawn through said aperture from said first operative position such that said handle is free to move from said secondary to said primary operative position.

5,062,378

HYDROFOIL AND SURFBOARD TYPE ASSEMBLY

Jess R. Bateman, 2400 Palos Verdes Dr., West, #9, Palos Verdes Estates, Calif. 90274

Filed Nov. 16, 1989, Ser. No. 437,686
Int. Cl.[5] B63B *1/28*
U.S. Cl. 114—274 13 Claims

1. A surfboard and hydrofoil assembly comprising:

a surfboard including a generally elongated substantially flat board member having a density or specific gravity substantially less than that of water so that it will float, said surfboard having a top and a bottom surface and front and rear ends;

means including at least one hydrofoil member for supporting the main body of the surfboard out of the water when the assembly is moving forward at a relatively high speed; and

foil securing means for removably securing said hydrofoil member to the bottom of said surfboard;

means for securing a rope or cable to said assembly;

locking means being provided for holding said hydrofoil member in the assembled configuration with said surfboard;

said hydrofoil member having a vertical strut;

said foil securing means including trunk means for receiving said hydrofoil member;

said trunk means including a foil slot opening through said bottom surface of the surfboard;

said locking means including retractable engaging means for engaging and locking said strut in said trunk means;

said strut including at least one strut hole; and

said engaging means including for each said strut hole, a locking protrusion for extending through each said strut hole in a locking position, and spring means for biasing said engaging means into the locking position;

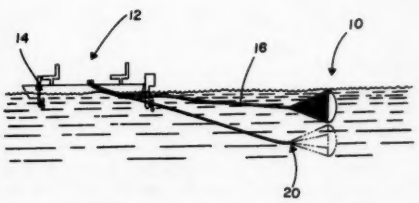
whereby said surfboard assembly may be towed behind a motor boat at high speeds, or may be used as a conventional surfboard, with said hydrofoil element being selectively removable.

5,062,379

METHOD AND APPARATUS FOR CONTROLLING THE SPEED OF BOATS

Phillip D. Cherry, 33637 Betts Dr., Zephyrhills, Fla. 33543

Continuation-in-part of Ser. No. 441,244, Nov. 27, 1989, abandoned. This application Jul. 10, 1990, Ser. No. 550,481
Int. Cl.[5] B63B *21/48*
U.S. Cl. 114—311 10 Claims



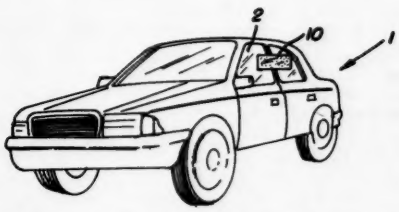
1. A speed reducing device for use from a fishing boat when fishing in a boat moving with the wind and/or current comprising:

a rearward portion formed as an essentially circular end panel of water impervious material having the buoyancy to float in water;

an intermediate portion formed of a plurality of similarly shaped mesh panels adapted to allow the flow of water therethrough while precluding the passage of debris into the device, each panel having a generally triangular configuration with a rearward edge and side edges converging and meeting at the forwardmost position, the panels being stitched together along the side edges into the general configuration of a cone with the small end of the cone constituting the forward end of the device and with the large end of the cone constituting the rearward end of the device, the end panel being stitched along its periphery to the rearward end of the mesh panels; and

a forward portion being formed by the folded midpoints of cords jointly coupled together at the small end of the cone and separately joined at the large end of the cone to the periphery of the end panel.

5,062,380
DISTRESS SIGNAL
Billy D. Chestnutt, Rte. 1, Box 299, Magnolia, N.C. 28453
Filed Aug. 24, 1990, Ser. No. 571,979
Int. Cl.[5] G09F *7/02*; B60Q *7/00*
U.S. Cl. 116—28 R **5 Claims**



1. A safety device for attaching to a vertically movable side window of a vehicle to indicate that a motorist is in need of aid, comprising:

(a) a first member and a second member integral with and at a right angle to each other;

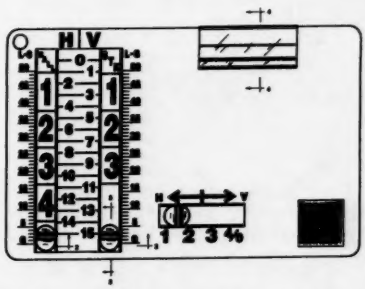
(b) said second member extending perpendicular from said window and having a width and length visible to passing motorists;

(c) said first member having a width about the same as said second member, and where said first member is parallel to said window to support said second member; and

(d) a mounting means on said first member for attaching and holding said safety device to said window.

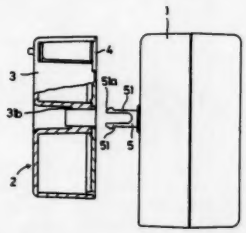
5,062,381
GAME DATA BOARD
Kenneth J. Hendricks, 718 Coral Ave., Bartlett, Ill.
Filed Aug. 29, 1990, Ser. No. 575,375
Int. Cl.[5] A63B *71/06*
U.S. Cl. 116—225 **24 Claims**

1. A GAME DATA BOARD comprising: a planar substrate having an upper surface and lower surface; a first marking slide; first passage means in said upper surface of said planar substrate for receiving said first marking slide and for permitting movement of said first marking slide therein; first indicia on said upper surface of said planar substrate adjacent said first passage means and arranged relative to said first marking slide so as to permit said first marking slide to be moved in said first passage means to various positions adjacent said first indicia for indicating particular scoring for at least one sport; a second marking slide; second passage means in said upper surface of said planar substrate for receiving said second marking slide and for permitting movement of said second marking slide therein; second indicia on said upper surface of said planar substrate adjacent said second passage means and arranged relative to said second marking slide so as to permit said second marking slide to be moved in said second passage means to various positions adjacent said second indicia for indicating



particular scoring for at least one other sport or game; said first passage means including an upwardly facing bottom surface; and third indicia on the bottom surface of said first passage means for indicating scores or statistics for the at least one other sport or game.

5,062,382
FEEDER
Takumi Matsuda, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Mar. 13, 1990, Ser. No. 492,636
Claims priority, application Japan, Mar. 14, 1989, 1-28580[U]
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—51.04 **15 Claims**



1. A feeder having a rotational driving apparatus and a feed box detachably connected to said rotational driving apparatus and rotationally driven by said driving apparatus, the improvement comprising:

said feed box comprises a container, and a cover detachably coupled to said container by a snap fitting method;

coupling means for detachably coupling said container and said cover with a snap fit, said coupling means comprising engagement portions defined by inner walls of an engagement hole of said container and two elastic engagement arms integrally formed on said cover;

two elastic engagement arms at an end of a driving shaft projecting from said rotational driving apparatus; and wherein said elastic engagement arms of said driving apparatus are inserted with a snap fit into said elastic engagement arms of said cover and engage with said engagement portions on the inner walls of said engagement hole of said feed box in such a manner to inhibit inward deformation of said elastic engagement arms of said cover.

5,062,383

ANIMAL LITTER CONTAINING AN IMPROVED CLAY

Thomas E. Nelson, 3614 Montrose Blvd., #906, Houston, Tex. 77006

Filed Oct. 25, 1989, Ser. No. 427,009
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—173 12 Claims

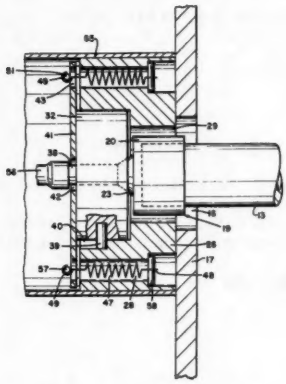
1. A method of improving a regular volatile material Fuller's Earth clay for use as an animal litter, comprising the step of adding water to the regular volatile material Fuller's Earth clay to increase its free moisture content to more than 7 weight percent.

5,062,384

VACUUM CHUCK ROTARY SEAL

Thomas P. Foley, Stony Brook, and Roger Mosciatti, Coram, both of N.Y., assignors to MFM Technology, Inc., Ronkonkoma, N.Y.

Filed Nov. 13, 1989, Ser. No. 435,259
Int. Cl.[5] B05C *13/00*
U.S. Cl. 118—500 10 Claims



1. A rotary device comprising a motor having an axially bored drive shaft, a vacuum chuck mounted on one end of said shaft; a first seal member mounted on the other end of said shaft opposite said chuck end; a floating second seal member of restricted rotation; means mounting said second seal member coaxial with said first seal member and longitudinally movable relative thereto and for restricting its rotation; one of said seal members having formed therein an axial socket with a first conical face terminating in a base at its inner end and having a bore communicating with said socket and the other seal member having an axial projection with a second conical face nesting in said socket and superimposed on and slidably engaging said first conical face and provided with an axially extending bore, the apex of said projection being axially spaced from said base of said socket; means connecting one of said bores to a vacuum source and means for axially resiliently biasing said seal members toward each other to urge said first and second faces into mutual engagement.

5,062,385

OPEN-CELL FOAM DEVELOPING ROLLER

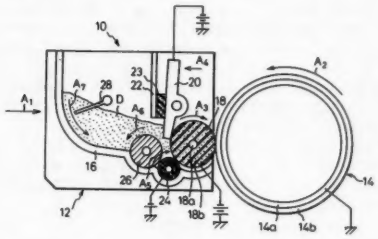
Yukio Nishio, Tama, and Kazonori Hirose, Hiratsuka, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 2, 1990, Ser. No. 517,898
Claims priority, application Japan, May 11, 1989, 1-118385
Int. Cl.[5] G03G *15/08*
U.S. Cl. 118—653 31 Claims

1. A developing device using a one-component developer, said developing device comprising:

a vessel for holding a one-component developer composed of toner particles;

a developing roller rotatably provided within said vessel in such a manner that a portion of said developing roller is exposed therefrom and faces a surface of an electrostatic latent image carrying body; and



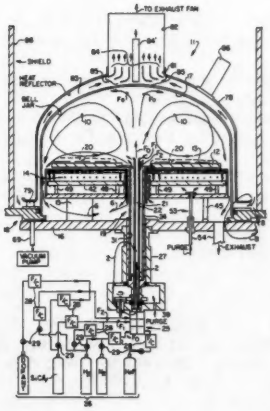
said developing roller formed of a monolithic conductive open-cell foam elastic material, an outside peripheral surface of said conductive open-cell foam elastic material thermally or chemically fused to prevent a penetration of the toner particles to an open-cell foam structure of said developing roller.

5,062,386

INDUCTION HEATED PANCAKE EPITAXIAL REACTOR

Robert W. Christensen, Monte Sereno, Calif., assignor to Epitaxy Systems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 78,278, Jul. 27, 1987, abandoned. This application May 23, 1989, Ser. No. 356,293
Int. Cl.[5] C23C *16/46*
U.S. Cl. 118—725 22 Claims



1. In an inductively heated pancake epitaxial reactor for processing wafers by depositing a film of epitaxial material on the wafers:

pancake susceptor means for holding the major faces of the wafers to be processed generally in a horizontal plane for transferring heat to the wafers;

inductive heater means for heating said susceptor means and wafers as held by said susceptor to an elevated deposition temperature by radio frequency induction;

bell jar means for enclosing said susceptor means and the wafers to be processed and for controlling the atmosphere in a deposition zone defined within said bell jar means and overlaying the wafers being processed;

gas distribution means for feeding reactant gases into said deposition zone along a flow path generally radially directed of said pancake susceptor means;

said gas distribution means including a plurality of tubes with their longitudinal axes being generally vertically oriented for feeding said reactant gases into the deposition zone overlaying said wafers;

deflector means disposed proximate the open upper end of at least one of said tubes of said gas distribution means for imparting a substantial radial component of velocity to at least a portion of the flow of reactant gases inducted into said deposition zone, said tubes being coaxial and said deflector means comprising a radially flared flange carried upon one of said coaxial tubes and said flange overlaying the open upper end of another one of said coaxial tubes; and

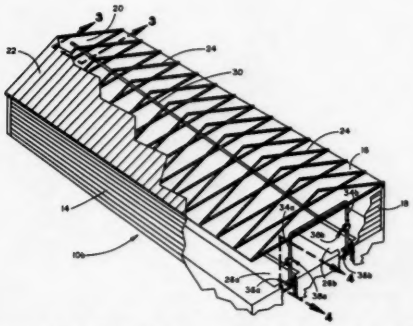
flow control means for feeding said gases through said plurality of tubes at different controlled flow rates, whereby control of the deposition is obtained by control of the respective reactant gases through respective ones of said plurality of tubes.

5,062,387

ANIMAL WASTE COLLECTION PIT FLUSHING APPARATUS AND METHOD

Ricky Anderson, Highway 18 West, Box 1816, Mason City, Iowa 50401

Filed Oct. 9, 1990, Ser. No. 594,016
Int. Cl.[5] A01K *1/01*
U.S. Cl. 119—28 **3 Claims**



1. A method of cleaning a waste collection pit of an animal housing facility, comprising the steps of:

(a) creating a head of water pressure in an overhead reservoir within said facility;

(b) applying said head of pressure to a gate valve;

(c) opening said gate valve;

(d) directing said water from said gate valve to a water distributor to distribute said water across the collection pit; and

(e) wherein said water flushes the waste from the collection pit.

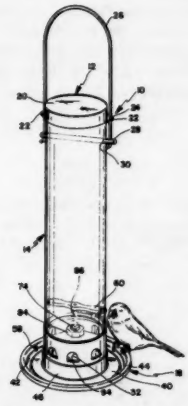
5,062,388

BIRD FEEDER

Peter Kilham, Foster, R.I., assignor to Droll Yankees, Inc., Foster, R.I.

Continuation-in-part of Ser. No. 439,236, Nov. 20, 1989, Pat. No. 4,977,859. This application Dec. 4, 1990, Ser. No. 622,832
The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.
Int. Cl.[5] A01K *39/00*
U.S. Cl. 119—52.2 **4 Claims**

1. A bird feeder comprising a vertically disposed cylindrical housing having upper and lower ends, a ring member of substantially the same diameter as said housing positioned at the lower end thereof, said ring member having upper and lower extremities, a plurality of circumferentially spaced feed apertures in said ring member, a tray member having a peripheral skirt extending outwardly adjacent the lower extremity of said ring member, said tray member having a wall portion that closes off the bottom of said feeder, and means for securing said housing, ring member and tray member in assembled



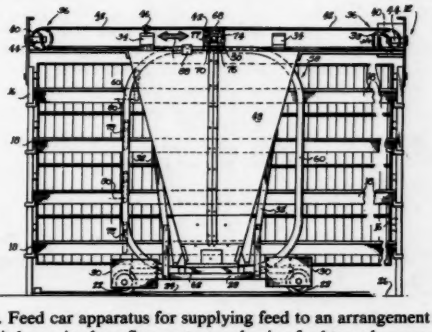
relation, said securing means comprising a locking arm extending diametrically across said housing and being secured thereto in spaced relation above said bottom, a threaded hole extending through said locking bar at approximately the midpoint thereof, a central opening in said bottom, and an elongated screw member extending upwardly through said opening into threaded engagement with said hole, whereby tightening of said screw secures said tray member to said housing, with said ring member clamped therebetween.

5,062,389

FEED CAR APPARATUS

Michael E. Krehl, Corunna, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Aug. 21, 1990, Ser. No. 570,386
Int. Cl.[5] A01K *5/02*
U.S. Cl. 119—57.6 **16 Claims**



1. Feed car apparatus for supplying feed to an arrangement of bird or animal confinement cages having feed trough means of a predetermined length associated therewith, said feed car apparatus comprising:

hopper means for receiving and maintaining a limited amount of feed;

movable support frame means operatively associated with

said hopper means for carrying said hopper means along and adjacent to said feed trough means;

feed delivery means mounted on said hopper means for delivering feed from said hopper means into said feed trough means; and

drive means operatively associated with said support frame means and said delivery means for moving said hopper means and operating said delivery means;

wherein, said feed delivery means comprises a continuous moving conveyor element and housing for receiving feed in a horizontal position from said hopper means, a drop tube means for filling said feed trough means and a leveling member operatively associated with the drop tube means for selectively controlling the amount of feed deposited and maintaining a uniform level of feed within the trough means.

5,062,390

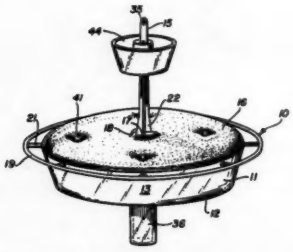
BIRD FEEDER

Robert E. Bescherer, Bristol, and Barry D. Colvin, Hope, both of R.I., assignors to Aspects, Inc., Warren, R.I.

Filed Nov. 23, 1990, Ser. No. 617,343

Int. Cl.[5] A01K *7/00*

U.S. Cl. 119—72 **6 Claims**



1. Hummingbird feeder comprising

(a) a bowl having a bottom wall and having a side wall terminating in an upper edge,

(b) an elongated stem having a lower end fixed to the center of the bottom of the bowl and extending upwardly therefrom,

(c) a cover overlying the upper edge of the bowl and having a central aperture through which the stem extends, said cover with said bowl defining an enclosure and wherein said cover includes a plurality of feed entrances into the enclosure, and

(d) a quick-release locking means associated with the stem and the aperture to fasten the cover to the stem and to hold the cover tightly on the upper edge of the bowl.

5,062,391

BRACKET FILLER FOR ANIMAL WATERING DEVICE

Robert D. Hostetler, Elkhart, Ind., assignor to Avtron, Inc., Elkhart, Ind.

Filed Jan. 29, 1991, Ser. No. 647,153

Int. Cl.[5] A01K *39/02*

U.S. Cl. 119—72 **20 Claims**

1. A water supply system for fowl or small animals, comprising:

an elongate ballast member;

a tubular water supply conduit;

a bracket assembly for rigidly attaching said conduit to said ballast member, said bracket assembly including a peripheral wall defining a hole and an interior region;

a plurality of valve means on said conduit for providing water to the fowl or small animals, said plurality of valve means in fluid communication with said conduit;

suspension means for suspending said ballast member and said conduit; and

a bracket insert disposed within said bracket assembly, said bracket insert blocking passage of any particles through said hole and into said interior region.

5,062,392

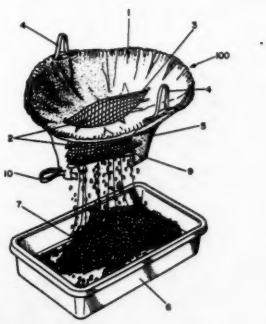
FILTERING AND DISPOSAL SYSTEM FOR PET LITTER

Bruce W. Lavash, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 10, 1990, Ser. No. 507,697

Int. Cl.[5] A01K *29/00*

U.S. Cl. 119—167 **28 Claims**



1. A disposable filtering and disposal system for installation in a litter box beneath a granular litter material contained in said litter box, said system and said granular litter material being used by an animal owner for the collection of both solid and liquid animal excreta, said system being capable of automatically separating substantially all of the solid animal excreta from the granular litter material contained in said litter box when said system is lifted from said litter box to initiate the filtering operation, said system comprising:

(a) a porous filtering member having an uppermost surface and exhibiting a pore size which will readily permit the granular litter material to pass therethrough, yet retain substantially all of the solid animal excreta coming in contact therewith during the filtering operation on its uppermost surface; and

(b) a protective member having a perimeter substantially coinciding with said litter box and an uppermost surface which contacts the granular litter material contained in said litter box in use and which is capable of substantially resisting damage when subjected to digging or clawing by animals secured in superposed relation to and completely overlying said uppermost surface of said porous filtering member, said protective member including means for forming an opening having a predetermined periphery in its uppermost surface when said filtering and disposal system is lifted from the litter box to initiate the filtering operation, said filtering member being secured in underly-

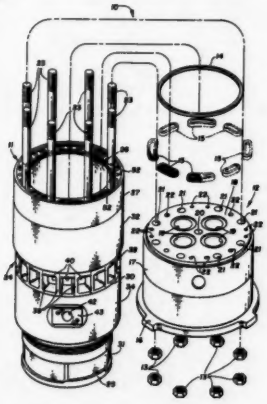
ing relation about said predetermined periphery of said opening in said protective member so that said filtering member is protected from damage due to digging or clawing by animals during the normal use cycle by said overlying protective member, yet substantially all of the granular litter material containing said solid animal excreta which is located on said uppermost surface of said protective member will pass through said opening and be filtered by said filtering member when said system is lifted from said litter box.

5,062,393

ENGINE CYLINDER LINER, SEALS AND ASSEMBLY THEREWITH

Stephen Smith, Downers Grove, and Dale F. Engelhardt, Orland Park, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1990, Ser. No. 600,958
Int. Cl.[5] F02F *1/10*
U.S. Cl. 123—41.72 **14 Claims**



1. An engine cylinder liner comprising

a body defining a generally cylindrical inner bore wall spaced radially within an annular outer coolant jacket wall and an annular flange having amounting and sealing end and joining the bore and jacket walls at an opposite end to form a coolant jacket between the walls and adjacent the flange,

a plurality of fastening means in the flange and opening to its mounting end at annularly spaced points axially aligned with the coolant jacket,

a plurality of coolant passages between each spaced pair of the fastening means and extending axially through the flange from the coolant jacket, and

manifold recesses in the flange mounting end, one between each spaced pair o the fastening means and interconnecting outer ends of the coolant passages located between each spaced pair of said fastening means.

5,062,394

MECHANISM FOR CONVERTING RECIPROCATORY MOTION INTO ROTARY MOTION IN AN ENGINE

James R. Belford, 184 Lake Shore Dr., Pasadena, Md. 21122

Continuation-in-part of Ser. No. 71,103, Jul. 8, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 423,562
Int. Cl.[5] F02B *75/24*
U.S. Cl. 123—56 AC **6 Claims**

1. An engine, such as an internal combustion engine, wherein the engine comprises:

at least first and second opposed pistons, the pistons having pressure faces in opposite directions;

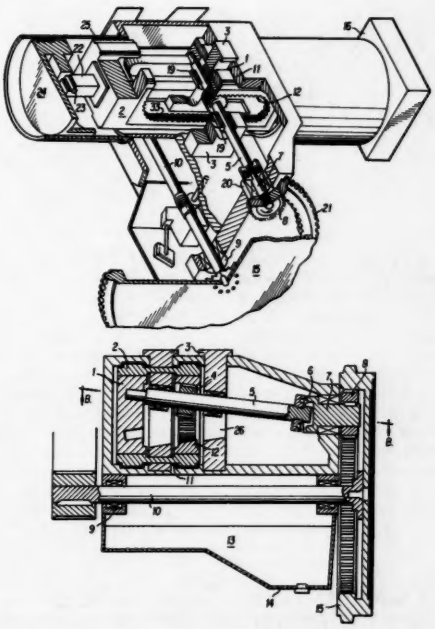
cylinder means enclosing the face of each piston and means for applying pressure alternatively to one piston face and then the other;

a connecting assembly for connecting the two pistons together;

means for restraining the connecting assembly to only straight-line, reciprocal motion with respect to the cylinder means over a straight-line path of motion;

means for connecting the pistons to the connecting assembly, the connecting means being restrained from moving laterally with respect to either the piston or the assembly;

an enclosed track, within the connecting assembly, the enclosed track including opposed spaced apart straight-



toothed sections joined by semi-circular end-toothed sections to form a continuous, internally toothed surface;

a circular gear received within the track and meshed thereto;

a drive shaft connected to the gear and having an axis extending in a plane perpendicular to a plane including the path of motion of the connecting assembly;

means in engagement with the drive shaft for holding the gear in continuous engagement with the track;

means for restraining the shaft to rocking motion as the drive shaft rotates about its axis with the axis of the drive shaft remaining in a plane oriented normally to the plane including the direction of motion of the assembly;

an output shaft aligned with the drive shaft; and

coupling means for connecting the drive shaft to the output shaft wherein as the drive shaft rotates and oscillates, the output shaft rotates.

5,062,395

TWO-STROKE INTERNAL COMBUSTION ENGINE

Manabu Tateno, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

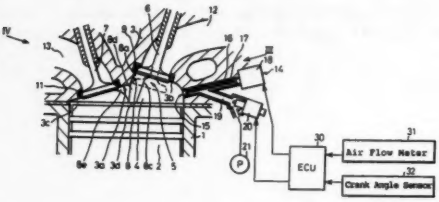
PCT No. PCT/JP89/00650, § 371 Date Mar. 30, 1990, § 102(e) Date Mar. 30, 1990, PCT Pub. No. WO90/00222, PCT Pub. Date Jan. 11, 1990

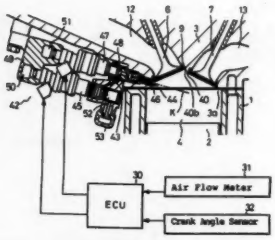
PCT Filed Jun. 29, 1989, Ser. No. 465,159

Claims priority, application Japan, Jul. 1, 1988, 63-162399

Int. Cl.[5] F02B *75/02*

U.S. Cl. 123—65 VD **18 Claims**





1. A two-stroke internal combustion engine provided with a piston which moves reciprocatively in a cylinder, a cylinder head which has an inner wall surface, at least one intake valve which is arranged on a cylinder head inner wall surface, at least one exhaust valve which is arranged on the cylinder head inner wall surface, a masking means which is arranged between the intake valve and the exhaust valve to close off a portion of the opening toward the exhaust valve that exists between the peripheral edge of the intake valve and a valve seat when the intake valve is open, a fuel injection means which is arranged at the peripheral side portion of the cylinder head inner wall of the intake valve side, and a control means which controls the fuel injection from the fuel injection means to the cylinder, the control means starting the fuel injection from the fuel injection means to the cylinder when the intake valve is opening.

5,062,396

DEVICE AND METHOD FOR INTRODUCING A CARBURETTED MIXTURE UNDER PRESSSURE INTO THE CYLINDER OF AN ENGINE

Pierre Duret, rue du Conservatoire, and Jean-Luc Blanchard, rue Henri Dunant, both of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

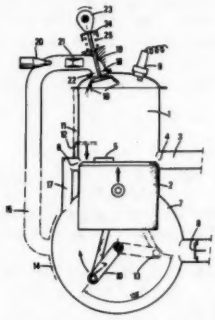
Continuation of Ser. No. 210,912, Jun. 24, 1988, abandoned. This application Nov. 9, 1989, Ser. No. 461,487

Claims priority, application France, Jun. 26, 1987, 87 09035

Int. Cl.[5] F02M *23/00*

U.S. Cl. 123—73 BA **21 Claims**

1. A device for introducing a carburetted mixture into a first engine cylinder of an internal combustion engine having at least one other engine cylinder with a crankcase pump, the device comprising a non-pressurized connecting duct disposed between said crankcase pump of said at least one other engine cylinder and the first engine cylinder and serving as a direct communication between said crankcase pump and said at least one other engine cylinder whereby the crankcase pump of said at least one other engine cylinder forms a sole pressure source for supplying necessary pressure through said connecting duct thereby enabling the introduction of the carburetted mixture



under pressure into the first engine cylinder, and wherein an angular non-zero shift exists between cycles of said first engine cylinder and said at least one other engine cylinder.

5,062,397

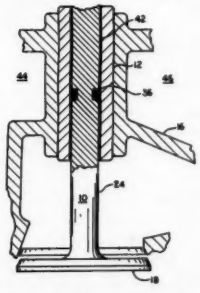
VALVE STEM SEAL

Jay M. Larson, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 7, 1990, Ser. No. 578,379

Int. Cl.[5] F01L *3/08*

U.S. Cl. 123—188 P **10 Claims**



1. In an internal combustion engine comprising a cylinder head, a tubular valve guide received in a bore formed in said cylinder head, a poppet valve having a stem portion slidingly received in said valve guide, and a valve stem seal substantially preventing engine oil from traveling past said valve guide to the head end of said poppet valve; the improvement wherein an annular groove is formed in said stem portion and said valve stem seal comprises a ring type seal element received in said groove and in sealing contact with the inside diameter of said valve guide.

5,062,398

APPARATUS AND METHOD FOR CHANGING OIL IN AN INTERNAL COMBUSTION ENGINE WITH OPTIONAL FLUSHING

Ram D. Bedi, and Adrianus J. van der Griendt, both of Birmingham, Mich., assignors to K. J. Manufacturing, Wixom, Mich.

Filed Apr. 27, 1990, Ser. No. 516,243

The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.

Int. Cl.[5] F01M *11/04*

U.S. Cl. 123—196 R **20 Claims**

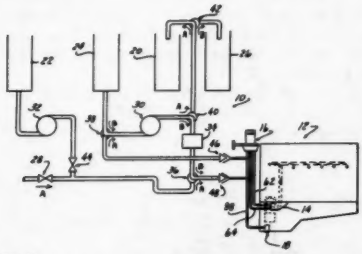
14. An apparatus for changing oil in an internal combustion

engine having an internal oil lubrication distribution passage system with an oil pump, an oil filter and an oil reservoir, the apparatus comprising:

fluid supply passage means having a disengagable fluid connection with said internal oil lubrication distribution passage system at a point between said oil pump and said oil filter;

fluid withdrawal passage means having a disengagable fluid connection in fluid communication with a lowermost portion of said oil reservoir of said internal combustion engine;

first fluid supply passage means connectible with an external storage receptacle;



first fluid discharge passage means connectible with an external spent fluid storage receptacle;

pump means having inlet passage means and outlet passage means;

first valve means for selectively connecting said inlet passage means with said fluid withdrawal passage means and with said first fluid supply passage means;

second valve means for selectively connecting said outlet passage means with said fluid supply passage means to said internal combustion engine and with said first fluid discharge passage means.

5,062,399

PISTON PROTECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

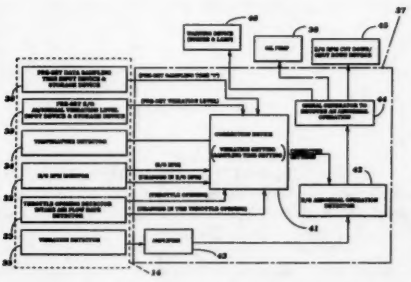
Hodaka Nagakura, and Tsuneshi Kondo, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 26, 1990, Ser. No. 514,729

Claims priority, application Japan, Apr. 26, 1989, 1-106842

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 D **20 Claims**



1. A control system for protecting a reciprocating engine from damage, comprising means for measuring the vibrations of the engine, means for comparing the vibrations measured with those predicted to cause detrimental operation, means for initiating protective operation of the engine to preclude damage in the event the measured vibrations exceed those determined to be detrimental to engine operation, and means for calculating the acceleration of the vibrations from the measured vibrations.

5,062,400

DIESEL ENGINE SHUT-DOWN DEVICE

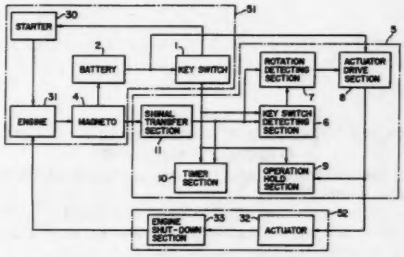
Masami Minegishi, Urawa, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1990, Ser. No. 622,412

Claims priority, application Japan, Dec. 14, 1989, 1-144719

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 DB **5 Claims**



1. A diesel engine shut-down device for stopping a diesel engine having engine shut-down means for cutting at least one of a fuel and an intake air, an actuator linked to actuate the engine shut-down means, and an engine key switch, comprising:

key switch detecting means for detecting an ON/OFF state of the key switch and producing an engine stop signal when the key switch is in the OFF state;

rotation detecting means responsive both to the engine stop signal and a rotation state of the engine so as to produce an actuator drive signal when the engine is rotating;

actuator drive means responsive to the actuator drive signal for driving the actuator; and

timer means for stopping the production of the engine stop signal when a predetermined period of time elapses after the key switch is turned off, wherein the actuator is stopped when the predetermined period of time elapses even if the engine is not stopped though the actuator has operated.

5,062,401

FUEL SUPPLYING DEVICE FOR MARINE PROPULSION UNIT

Yasuo Suganuma, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 21, 1990, Ser. No. 616,648

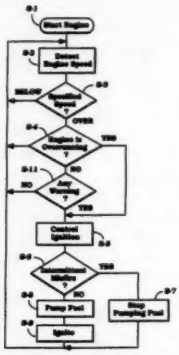
Claims priority, application Japan, Nov. 22, 1989, 1-301905

Int. Cl.[5] F02B *77/08;* **F02D** *41/22;* **F02P** *11/02*

U.S. Cl. 123—333 **11 Claims**

1. An internal combustion engine having an ignition system for initiating combustion in a combustion chamber a fuel system for supplying fuel to said combustion chamber, means for detecting an abnormal engine condition, means for slowing the

speed of said engine in response to the detection of an abnormal condition by misfiring of the ignition means, and means for



precluding the flow of fuel to the engine from said fuel system when ignition is interrupted.

5,062,402

KNOCKING CONTROL APPARATUS OF INTERNAL COMBUSTION ENGINE

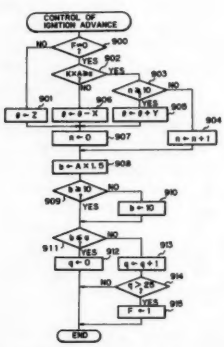
Yuji Takeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 9, 1990, Ser. No. 565,580

Claims priority, application Japan, Aug. 10, 1989, 1-207251; Aug. 30, 1989, 1-223466

Int. Cl.[5] F02P *5/14*

U.S. Cl. 123—425 **27 Claims**



1. A knocking control apparatus comprising:

detection means for detecting the strength of vibrations generated by an engine in a predetermined range of crank angle;

updating means for updating a maximum frequency point, said maximum frequency point occurring at that strength of engine vibration generated most frequently by the engine in said predetermined range of crank angle;

level setting means for setting a knocking determination level based on said maximum frequency point; and

judgement means for judging that knocking has occurred when the maximum strength of vibration occurring in the engine exceeds said knocking determination level, a first region of a predetermined fixed width being set at the side of the larger strength of vibration of the maximum frequency point, a second region which has the same width as the first region being set at the side of the smaller strength of vibration of the said maximum frequency point, said updating means increasing the said maximum frequency point by a predetermined correction when the maximum strength of vibration occurring in the engine is in said first region and decreasing said maximum frequency point by said predetermined correction when the maximum strength of vibration occurring in the engine is in said second region.

5,062,403

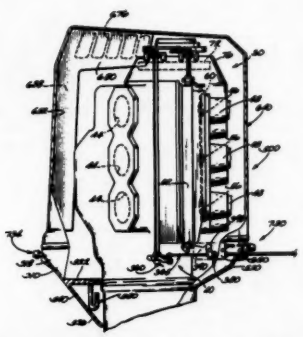
INTERNAL COMBUSTION ENGINE

Paul W. Breckenfeld, Kenosha, Wis.; James A. Nettles, Round Lake, Ill.; Duane E. Rogers, Kenosha, Wis., and George Broughton, Zion, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 18, 1990, Ser. No. 525,746

Int. Cl.[5] F02P *5/02*

U.S. Cl. 123—413 **54 Claims**



1. An internal combustion engine comprising an engine block, a spark control member movably mounted on said engine block, means for controlling the spark timing of said engine in response to movement of said spark control member, a first actuating member movably mounted on said engine block, and means for adjustably connecting said first actuating member to said spark control member for effecting common movement of said first actuating member and said spark control member in response to operating movement of said first actuating member and for permitting adjustment of said spark control member relative to said actuating member independently of operating movement of said first actuating member.

5,062,404

ENGINE THROTTLE CONTROL SYSTEM

Peter G. Scotson, West Midlands, and John M. Ironside, Birmingham, both of England, assignors to Lucas Industries Public Limited Company, England

Filed Apr. 13, 1990, Ser. No. 509,391

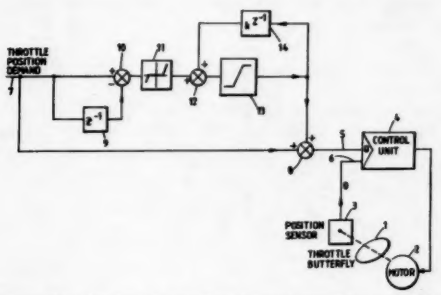
Claims priority, application United Kingdom, Apr. 17, 1989, 8908661

Int. Cl.[5] F02D *41/00, 9/02*

U.S. Cl. 123—399 **10 Claims**

1. An engine throttle control system for a throttle motor, said system comprising a control circuit for supplying a drive to the throttle motor in response to an error between a throttle position demand signal and an actual throttle position signal,

said control circuit including augmenting means responsive to a change in the throttle position demand signal for temporarily



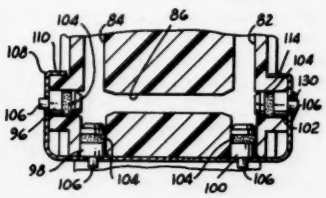
augmenting the throttle position demand signal by applying a transient increase to the change in the throttle position signal.

5,062,405

INTAKE MANIFOLD/FUEL RAIL AND METHOD

Paul D. Daly, Troy, Mich., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Aug. 7, 1990, Ser. No. 563,459
Int. Cl.[5] F02M *55/02*; F16L *55/10*
U.S. Cl. 123—468 **14 Claims**



1. A method of making a part for an internal combustion engine, said part comprising a fuel rail, said method comprising creating in the part fuel passageway structure serving injector-receiving socket structure and having plural openings at the exterior surface of the part, disposing openable and closeable fuel injectors in said socket structure to create sealed volumes within said socket structure that are in fluid communication with said fuel passageway structure, inserting into each of one or more of said plural openings a corresponding closure such that each such closure does not protrude from the corresponding opening beyond the exterior surface of the part, disposing over each such closure-containing opening a keeper means which is adapted for engagement by the corresponding closure to prevent the corresponding closure from being removed from closure of the corresponding opening via the exterior of the part, and with the fuel injectors closed, placing the remainder of said plural openings in association with externally supplied pressure fluid to cause each such closure to move into engagement with the overlying keeper means

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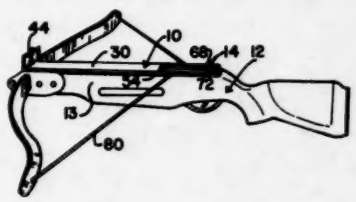
5,062,406

ATTACHMENT FOR CROSSBOW THAT SHOOTS ARROWS TO ENABLE THE CROSSBOW TO SHOOT SLUGS

David H. Robertson, P.O. Box 3625, Palmer, Ak. 99645

Continuation-in-part of Ser. No. 143,951, Jan. 14, 1988, abandoned. This application Aug. 11, 1989, Ser. No. 392,442
Int. Cl.[5] F41B *5/02*
U.S. Cl. 124—25 **34 Claims**

1. In a device for shooting either arrows or slugs:
a crossbow defining an elongated groove and having means for shooting arrows with a feather of the arrow guided by said groove, said crossbow having a bow string,
a removable elongated guiding means which when added to said crossbow enables the crossbow to shoot slugs,
said removable elongated guiding means when added to said crossbow cooperating with said elongated groove to provide apparatus having two parallel elongated grooves that form a barrel for the slug fired by the crossbow,



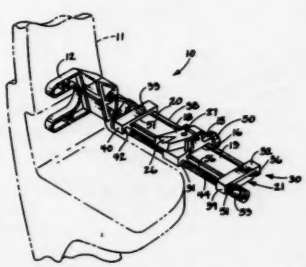
means for removably supporting said elongated guiding means on said crossbow so that when said elongated guiding means is removed from said crossbow that the crossbow may be used to shoot arrows,
said elongated guiding means forming, with said crossbow, a slot that extends along at least a limited length of said barrel, said bowstring passing laterally through said slot, so that a slug may be shot out of said barrel.

5,062,407

ARROW REST AND ARROW LAUNCHER ADJUSTMENT APPARATUS

George T. Newbold, Walla Walla, Wash., assignor to Martin Archery, Inc., Walla Walla, Wash.

Filed Jun. 21, 1990, Ser. No. 541,592
Int. Cl.[5] F41B *5/22*
U.S. Cl. 124—44.5 **9 Claims**



1. An arrow launcher adjustment apparatus for adjusting an arrow launcher laterally along an elongated lateral support bar of an arrow rest apparatus, the arrow launcher apparatus comprising:
an arrow launcher support block, the support block having a threaded bore extending generally laterally therethrough and being slidably mountable to the arrow rest lateral support bar for lateral movement relative thereto;
an arrow launcher supported by the support block;
a laterally elongated threaded rod threadably received by the support block threaded bore, the threaded rod being mountable laterally along the arrow rest lateral support bar for rotation relative to the support bar and support block, rotation of the threaded rod when so mounted imparting lateral movement to the support block;
locking means on the support block and apart from the threaded rod for selectively locking the support block at a selected lateral position along the arrow rest lateral support bar; and
a pair of end blocks removably mountable to the arrow rest

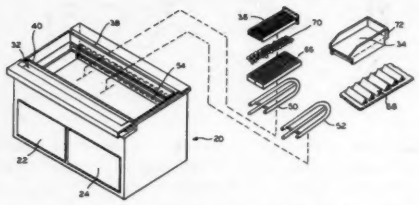
lateral support bar, each end block having a barrel, the threaded rod being slidably received through the barrel for rotation therein.

5,062,408

CHARBROILER

Mark Smith, and Larry Cooper, both of Fuquay-Varina, N.C., assignors to Middleby Corporation, Rosemont, Ill.

Filed Apr. 19, 1990, Ser. No. 511,044
Int. Cl.[5] F24C *3/08*
U.S. Cl. 126—41 R **11 Claims**



1. A charbroiler for cooking food comprising a cabinet including:

an upper cooking level and;

an intermediate heat distribution level;

a plurality of grids for providing a cooking surface, for mounting on said upper cooking level; each grid having a width which is the same or a uniform multiple of at least one other grid;

a plurality of griddles for providing a cooking surface, for mounting on said upper cooking level, each griddle having a width which is the same as or a uniform multiple of at least one other griddle and grid;

whereby a cooking surface may be formed by an assembly of any suitable and desired combination of griddles and grids;

a first pair of spaced parallel support means at said upper cooking level for supporting either a plurality of grills, a plurality of griddles or a combination of griddles and grills on said upper cooking level;

a second pair of spaced parallel support means at said intermediate heat distribution level for supporting a selected one of said heat distribution means in the form of a plurality of ceramic briquettes and a sheet metal radiant heat distribution plate;

whereby either said ceramic briquettes or said sheet metal radiant heat distribution plate is positioned on the intermediate level supports and a plurality of grids, a plurality of griddles or a plurality of grids and griddles can be positioned on the upper level cooking supports;

said grids being positioned to drip grease drippings onto said heat distribution means to impart a smoky taste to the food being cooked.

5,062,409

HOT-AIR FURNACE

Ryusuke Kamanaka, Chigasaki, and Yoshio Kakuta, Sagamihara, both of Japan, assignors to Nepon Company, Ltd, Tokyo, Japan

Filed Apr. 16, 1990, Ser. No. 510,294
Claims priority, application Japan, Aug. 17, 1989, 1-210658
Int. Cl.[5] F24H *3/00*
U.S. Cl. 126—99 R **20 Claims**

1. A hot-air furnace, comprising:

a casing having an upper end and a lower end opposite said upper end;

a drum disposed within said casing and defining a combustion chamber and a heat exchanger;

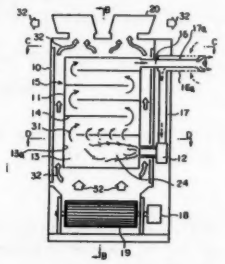
a long-flame burner for combusting a fuel in said combustion chamber;

said combustion chamber having a length (l) and width (w_1) in the relationship of $w_1 < l$;

said heat exchanger being located above said combustion chamber and having a gas flow guide plate for guiding combustion gas flow discharged from the combustion chamber to said heat exchanger;

said heat exchanger having a width (w_2) and length (l) in the relationship of $w_2 < l$; and

said heat exchanger being provided with an exhaust port located above said combustion chamber for exhausting the



combustion gas flow therefrom; an air flow guide and directing plate covering said drum;

a radiant heat absorber plate disposed between said combustion chamber and said casing;

a blower in the casing spaced from the drum;

a discharge port for discharging heated air from the furnace; and

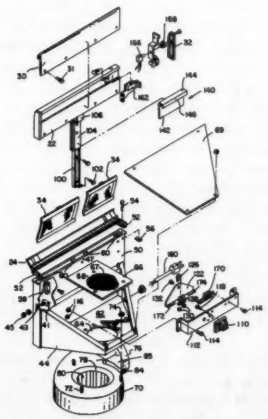
said blower and said discharge port being disposed at opposite ends of said casing whereby hot air is discharged from said casing at an opposite end to said blower.

5,062,410

DOWNDRAFT RANGE VENTILATOR

Joseph R. Sarnosky, Fort Atkinson; David W. Wolbrink, Hartford; Alan G. Klug, Mequon, and Gary E. Behm, West Bend, all of Wis., assignors to Broan Mfg. Co., Inc., Hartford, Wis.

Filed Jul. 23, 1990, Ser. No. 556,843
Int. Cl.[5] F24C *15/20*
U.S. Cl. 126—299 D **18 Claims**



1. A ventilator for drawing off cooking effluents produced at a cooking unit positioned in a generally horizontal surface, the ventilator comprising:

a housing suitable for mounting beneath the surface in which the cooking unit is positioned;

a vent member having an opening through which the cooking effluents may be drawn off, said vent member being movable in a generally vertical direction between a retracted position in which said vent member is proximate the surface and an extended position in which the vent extends above the surface adjacent to the cooking unit, said vent member being in fluid communication with said housing, at least when said vent member is in the extended position;

a blower coupled to said housing for drawing the cooking effluents into said opening in said vent member, downwardly through said vent member into said housing, and discharging same from said ventilator; and

means for moving said vent member between the retracted and extended positions, said means having;

follower means mounted on said vent member and having a follower surface;

motive power means; and

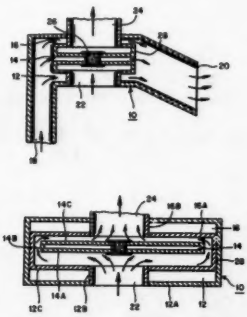
drive means coupled to, and movable by, said motive power means, said drive means having a drive portion engaging said follower surface and displaceable therealong, said drive portion being moved by said motive power means in an arcuate path in a plane generally parallel to the direction of movement of said vent member between said extended and retracted positions so as to have a vertical component of motion, displacement of said drive portion along said follower surface upon movement of said drive means driving said vent member upwardly to the extended position as a result of the vertical component of motion of said drive portion, the engagement of said follower surface and said drive portion controlling the return of said vent member downwardly to the retracted position.

5,062,411

LOW PRESSURE DROP FIREPLACE HEAT EXCHANGER

Tadeusz Karabin, Huntington, and Roy E. Mundy, Roann, both of Ind., assignors to MAJCO Building Specialties, L.P., Huntington, Ind.

Filed Jul. 11, 1990, Ser. No. 551,199
Int. Cl.[5] F24B *1/188*
U.S. Cl. 126—523 **17 Claims**



15. A heat exchanger assembly for use with a fireplace, comprising:

a heat exchanger housing including a top wall, a bottom wall, and a plurality of side walls connecting said top and bottom wall, said top, bottom and side walls defining a chamber;

a set of upper and lower walls connected to said side walls of said housing and defining an air conduit within said chamber, said air conduit being isolated from said chamber such that gas within said chamber will not mix with air within said air conduit, said upper and lower walls of said air conduit being generally parallel to the top and bottom walls of the housing;

a first opening within the bottom wall of said housing and communicating with said chamber, said first opening being in opposing relation to the lower wall of said air conduit;

a second opening within the top wall of said housing and communicating with said chamber;

an inlet opening within one of said side walls of said housing for admitting air to said air conduit; and

an outlet opening within one of said side walls of said housing for allowing air to exit said air conduit,

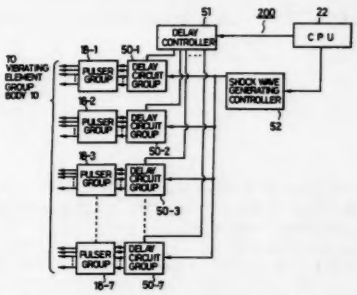
whereby heated flue gas entering said first opening will be deflected in opposing directions by said lower wall of said air conduit towards the side walls of said chamber, turned about one hundred eighty degrees as the flue gas moves from beneath the ar conduit to above the air conduit, and caused to exit through the second opening.

5,062,412

SHOCK WAVE GENERATING APPARATUS FORMING WIDE CONCRETION-DISINTEGRATING REGION BY FOCUSED SHOCK WAVE

Kiyoshi Okazaki, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1989, Ser. No. 426,546
Claims priority, application Japan, Oct. 31, 1988, 63-276628
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 OEL **6 Claims**



1. A shock wave generating apparatus comprising:

a plurality of high-voltage pulse generating means for generating a plurality of high-voltage pulses;

shock wave generating means having a plurality of ultrasonic vibrating element groups, coupled to said plurality of high-voltage pulse generating means, for generating shock waves and for focusing the shock waves onto a plurality of different focused regions within a biological body under examination; and,

a plurality of delay means coupled via said plurality of high-voltage pulse generating means to said plurality of ultrasonic vibrating element groups, for causing said plurality of high-voltage pulses to be generated from the high-voltage pulse generating means with predetermined delay times, whereby the plural focused regions are simultaneously formed juxtaposed each other near an object to be disintegrated within the biological body.

5,062,413

VACUUM TEETH CLEANING SYSTEM

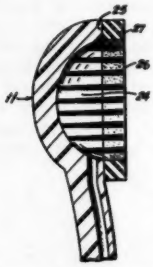
Horace Bullard, 3333 Henry Hudson Pkwy., Riverdale, N.Y. 10463

Continuation-in-part of Ser. No. 361,926, Jun. 6, 1989, Pat. No. 4,991,570. This application Nov. 8, 1990, Ser. No. 610,527

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

Int. Cl.[5] A61H *9/00*

U.S. Cl. 128—66 **11 Claims**



1. A system for cleaning a set of teeth and gum adjacent thereto comprising:

(a) vacuum means to create a vacuum;

(b) a source of liquid to be pulled by the vacuum to clean the teeth;

(c) a non-custom formed head means to removably form an air-tight chamber over one side of at least two teeth and no more than five teeth; said head means comprising a single head member having a flexible circumferential ring lip means to form an air tight seal against the teeth and a cavity in said head means adapted to face the teeth; said head being a cup like member and including a plurality of bristles within said cavity, said bristles having free ends adapted to contact said teeth;

(d) a vacuum line leading from the vacuum means to the cavity;

(e) a liquid line leading from the liquid source to the cavity; and

(f) control means connected to said vacuum line to intermittently apply vacuum from said vacuum means to said head means in order to pull liquid from said liquid means to within said chamber and thereby clean the teeth.

5,062,414

SIMPLIFIED ORTHOPAEDIC BACK SUPPORT

Tracy E. Grim, Broken Arrrow, Okla., assignor to Royce Medical Company, Westlake Village, Calif.

Continuation-in-part of Ser. No. 308,687, Feb. 8, 1989, Pat. No. 4,993,409. This application Jan. 11, 1990, Ser. No. 464,360

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—68.1 **17 Claims**

1. A simplified inflatable back support assembly comprising:

a main body member formed of elasticized material for extending continuously at least around both sides and the back of a patient;

said body member having an enlarged central area formed of said elasticized material for covering the lower back;

said body member having first and second arm means formed of said material for holding said back support assembly around the mid-section of the patient;

an inflatable assembly including a central inflatable bladder substantially co-extensive in configuration with said enlarged central area of elasticized material;

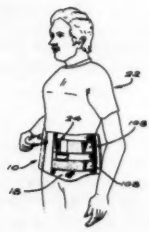
said inflatable assembly including at least two straps or thin arms directly secured to said bladder and extending outwardly along said first and second arm means and being substantially thinner than said arm means;

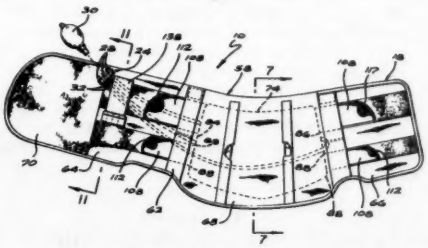
said first and second arm means being provided with transverse slits adjacent said central area to permit the passage of said straps therethrough, with the bladder on the inside of the enlarged central area of the main body member and said straps starting inside said main body member where said straps are secured to said bladder, and then extending along the outside of said main body member after passing through said slits;

means for adjustably securing the outer ends of said first and second arm means together to provide an initial coarse fit of said back support assembly onto said patient;

means for adjustably securing said straps to the outer surfaces of said arm means to provide a vernier fit of said back support assembly onto said patient; and

means for selectively applying air to said bladder assembly to provide a final therapeutic and comfort fit to said back support assembly.





5,062,415

CERVICAL TRACTION ORTHOTIC DEVICE

John H. Weatherby, Mullica Hill, N.J., and Jack M. Potts, Danielsville, Pa., assignors to Sttop Industries, Inc., Allentown, Pa.

Filed Sep. 17, 1990, Ser. No. 583,670

Int. Cl.[5] A61F *5/08*

U.S. Cl. 128—76 R **19 Claims**

19. A cervical traction orthotic apparatus comprising a form fitting semirigid vest, support rods structurally attached to an extending from the vest upwardly to a halo support ring, first connection means to adjustably and structurally attach lower ends of the support rods to the vest, and second connection means to adjustably and structurally attach upper ends of the rods to the halo ring, wherein:

(a) the halo ring comprises a halo ring member comprising:

(i) a partial oval section positionable essentially horizontally above the ears of the patient encircling the head from behind the ears around the forehead of the patient comprising a center, an outside surface facing outwardly from the center, and an inside surface facing inwardly toward the center,

(ii) an integral composition of unidirectional fibers around the ring member in a reinforced composite material,

(iii) a horizontal shoulder extending inwardly from the

inside surface of the partial oval section of the ring toward the center forming a horizontal annular surface, and

(iv) a multiplicity of horizontal circular holes through the partial oval section opening from the outside surface to the inside surface,

(b) the apparatus further comprises a multiplicity of insert devices each comprising:

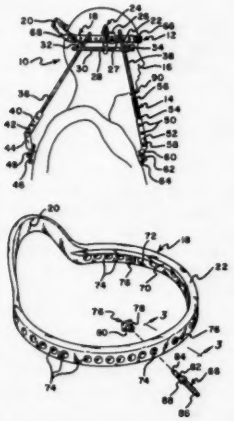
(i) a body comprising an outside shape and size to press fit into the horizontal holes and a length extending outwardly past the outside surface,

(ii) a bore the length of the body opening at both ends of the body forming an inside lengthwise cylindrical surface,

(iii) spiral threads on the inside surface of the bore, and

(iv) stop means to prevent the body from rotating in the hole comprising an integral member of the insert device located on an end of the body comprising at least one surface to abut the horizontal annular surface when the insert device is fitted into a hole,

(c) the support rods comprise a pair of the support rods connecting to the front of the vest, each of said support rods of the pair comprising:



(i) an upper rod section having an upper end and a lower end, the upper end connectable to the halo support ring through the second connection means,

(ii) a lower rod section having an upper end and a lower end, the lower end connectable to the vest through the first connection means,

(iii) the lower end of the upper section and the upper end of the lower section interconnectable by complimentary mating shapes comprising first mating aligned surfaces that are proximately horizontal and second aligned mating surfaces that are proximately vertical,

wherein when the mating shapes are interconnected the outer surface of the cross-section of the mated ends is essentially identical to the outer surface of the cross-section of both rod sections, and

(d) the apparatus further comprises:

(i) a locking cylindrical sleeve having an inside size and shape to closely fit over and surround the outer surface of the cross-sectional shape to slide over either section and over the mated ends,

(ii) support means to hold the sleeve at a height surrounding the mated ends, and

(iii) locking means to prevent inadvertant sliding of the sleeve away from surrounding the mated ends.

5,062,416

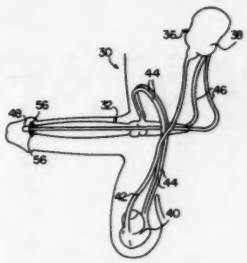
PENILE ERECTION SYSTEM

Albert A. Stucks, 6202 Spencer Hwy., #11, Pasadena, Tex. 77505

Filed Dec. 1, 1988, Ser. No. 278,489

Int. Cl.[5] A61F *2/26*

U.S. Cl. 128—79 **3 Claims**



1. An erection system for implanting in a male including:

a first inflatable cylinder for positioning within a first corpora carvernosa region within the male's penis;

a second inflatable cylinder for positioning within a second corpora carvernosa region within the male's penis;

a first fluid transfer means mounted in the first cylinder for directing fluid into the first cylinder and maintaining the fluid therein in a first state and releasing the fluid therefrom in a second state;

a second fluid transfer means mounted in the second cylinder for directing fluid into the second cylinder and maintaining the fluid therein in a first state and releasing the fluid therefrom in a second state;

a reservoir having fluid therein which is coupled to the first and second transfer means;

a pump for pumping fluid from the reservoir to the first and second fluid transfer means so that when fluid is maintained in the first and second fluid transfer means during the first state the first and second cylinders are inflated and so that when fluid is released from the first and second fluid transfer means during the second state the first and second cylinders are deflated; and

a fluid circulating means for allowing the fluid to circulate from the first and second cylinders through the pump, and back to the reservoir while fluid is transferred to the cylinders and the cylinders are being inflated to the first state whereby the recirculation of the fluid warms the penis.

5,062,417

PROSTHESIS WITH IMPROVED PUMP

Timothy B. Cowen, Andover, Minn., assignor to Mentor Corporation, Minneapolis, Minn.

Filed Oct. 10, 1990, Ser. No. 597,088

Int. Cl.[5] A61F *2/26*

U.S. Cl. 128—79 **5 Claims**

1. A penile prosthesis comprising:

a. at least one inflatable cylinder implantable within the corpus cavernosum of a patient;

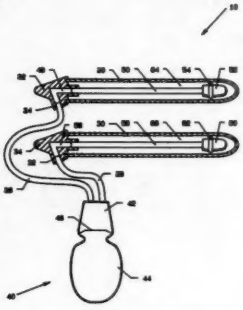
b. a reservoir chamber implantable within the scrotum of said patient having a first volume and having a flexible wall;

c. a pump chamber having a second volume and having a rigid wall fixedly attached to said flexible wall of said reservoir chamber;

d. means coupled to said at least one inflatable cylinder and said pump chamber for providing fluid communication between said at least one inflatable cylinder and said pump chamber;

e. means coupled to said providing means for regulating fluid transfer with said providing means; and,

f. a diaphragm containing a slot valve disposed between said reservoir chamber and said pump chamber for controlling



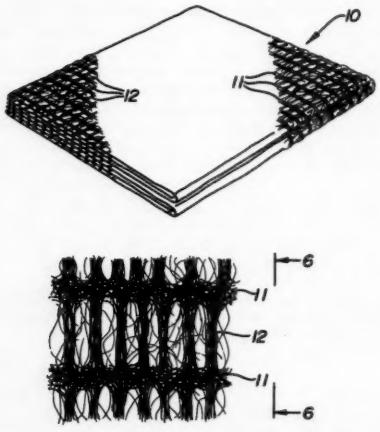
fluid communication between said reservoir chamber and said pump chamber.

5,062,418

NAPPED NONWOVEN FABRIC HAVING HIGH BULK AND ABSORBENCY

John Dyer, Randolph; Grace Mathews, Princeton, and Matthew M. Major, Sayreville, all of N.J., assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Jan. 31, 1989, Ser. No. 304,156
Int. Cl.[5] A61F *13/00, 15/00*
U.S. Cl. 128—156 **8 Claims**



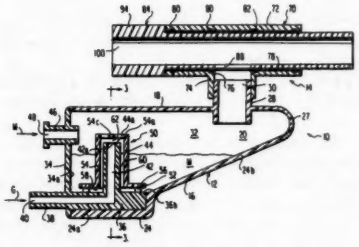
1. A nonwoven fabric, having a basis weight of from about 1.2 to 2.5 oz/yd^2, and comprising entangled staple fibers arranged in a repeating pattern of spaced, parallel ribs extending in one direction, with a plurality of spaced parallel fiber bundles extending between and interconnecting adjacent ribs, said fiber bundles being substantially perpendicular to said fibrous ribs, each of said ribs comprising a napped, bulky, highly entangled, dense, fibrous mass, and each of said fiber bundles comprising a loosely arranged group of substantially parallel staple fibers, whereby the ratio of four-ply bulk—measured in inches—to basis weight—in ounces per square yard—is greater than about 0.06.

5,062,419

NEBULIZER WITH VALVED "T" ASSEMBLY

Donald L. Rider, 25 Chianti, Reno, Nev. 89512

Filed Jan. 7, 1991, Ser. No. 637,907
Int. Cl.[5] A61M *11/00*
U.S. Cl. 128—200.21 **12 Claims**



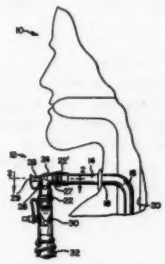
1. A horizontally elongated hollow, shallow nebulizer body having vertically spaced top and bottom walls, at least one vertical end wall and laterally opposed side walls joining said top wall to said bottom wall, said body being generally trapezoidal in side configuration, a horizontal source gas supply tube mounted to said at least one vertical end wall and opening internally thereof, a vertical pipe within said body, being connected to said source gas supply tube and terminating at an upper end in a reduced diameter nozzle opening, an inverted cup-like hollow cylindrical nozzle member having an inner diameter in excess of the outer diameter of said vertical pipe and concentrically surrounding said pipe and forming an annular liquid aspirating passage therebetween, said vertical pipe terminating at an upper end in an end wall extending across the upper end of said vertical pipe and being axially spaced above the end of said pipe to form a cylindrical mixing chamber between the upper end of said vertical pipe and the upper end of said nozzle member, at least one outlet opening in said nozzle member upper end wall, opening outwardly to the interior of said nebulizer body, said nebulizer body including means for supplying a liquid medication to the interior of said body and said shallow, hollow nebulizer body bottom wall including an upwardly oblique portion extending from the side of said vertical pipe and said inverted cup-like hollow, cylindrical nozzle member toward said top wall such that any liquid medication within said body tends to accumulate in the vicinity of said annular aspirating passage, said top wall including a cylindrical vertical outlet opening to the interior of said hollow nebulizer body and projecting upwardly therefrom, and wherein, said nebulizer further comprises a valved "T" hollow tube assembly comprising a horizontally elongated outer pipe, and a short length vertical pipe fixed thereto at one side thereof, and a cylindrical hole within the side of a said horizontal pipe sized to the bore of the short length vertical tube and opening thereto, and an adjustable valve member mounted internally of the horizontally elongated outer pipe, and selectively moveable to close off and open, the connection between the bore of the elongated horizontal pipe and the bore of the short length vertical pipe whereby, with liquid medication within said hollow nebulizer body, and a supply of a source gas to the horizontal source gas supply tube, passage of said gas through said vertical pipe interior of said body causes aspiration of liquid through said inverted cup-like hollow cylindrical nozzle member annular passage and mixing of the liquid medication and the source gas within said chamber, such that by opening and closing the valve of said valved "T" assembly, a mist of medication particles and said source gas is formed within said hollow body for entry into the bore of said elongated horizontal pipe for passage selectively through ventilator tubing into interior airways of a patient by a ventilation circuit including said nebulizer with said valved "T" assembly.

5,062,420

SEALED SWIVEL FOR RESPIRATORY APPARATUS

Walter Levine, 6948 North Keating, Lincolnwood, Ill. 60646

Filed Sep. 18, 1990, Ser. No. 584,253
Int. Cl.[5] A61M *16/00;* A62B *7/00*
U.S. Cl. 128—204.18 20 Claims



1. A swivel member for a respiratory connector having a respiratory connector fitting, comprising:

a tubular body having a first open end, a second open end and a central portion defining a swivel track adapted to sealingly and swivellingly engage an end of the connector fitting;

said first open end having an inner diameter and an outer diameter;

said second end having means for sealing said end to a tubular member, said means for sealing including at least one integral annular sealing band; and

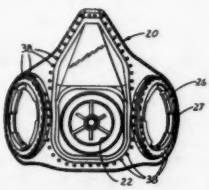
said swivel track including an annular collar circumscribing said body, being integrally secured to said body by an annular shoulder, and having an annular sealing rib projecting inwardly from an inner surface of said collar.

5,062,421

RESPIRATORY MASK HAVING A SOFT, COMPLIANT FACEPIECE AND A THIN, RIGID INSERT AND METHOD OF MAKING

James A. Burns, Lake Elmo, and Joseph G. Reischel, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 121,069, Nov. 16, 1987, abandoned. This application Feb. 19, 1991, Ser. No. 657,102
Int. Cl.[5] A62B *7/10*
U.S. Cl. 128—205.27 21 Claims



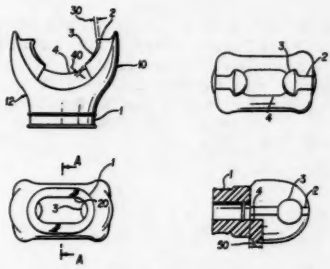
1. A structural member for use in a facepiece of a respiratory mask, said structural member being thin and rigid relative to the facepiece and having a pair of substantially flat, swept back cheek portions, each formed with an aperture and structure around the aperture to mate with and hold a filter cartridge, and a central portion having a nose aperture for an exhalation valve, and provided with discontinuities permitting the facepiece material to flow through the discontinuities under molding conditions to form a mechanical seal to the structural member.

5,062,422

OFFSET ANATOMICAL MOUTHPIECE

Donald J. Kinkade, Greeley, Colo., assignor to Kinkade Family Partnership, Greeley, Colo.

Continuation-in-part of Ser. No. 283,611, Dec. 13, 1988. This application Dec. 12, 1989, Ser. No. 449,560
Int. Cl.[5] A62B *9/06;* B63C *11/16*
U.S. Cl. 128—207.14 8 Claims



1. A mouthpiece oriented for an overbite comprising:

U shaped body member having first and second ends and upper and lower portions;

the first end formed in a generally oval shape and having an orifice formed therein;

the second end extending away from the orifice and formed into two leg members, each having an outer end;

an internal wing member formed on each leg member near the outer end thereof;

the lower portion of the U shaped member extending outwardly toward the leg members more than the upper portion of the U shaped member to form an offset which reaches to the lowest level of the internal wing members;

the internal wing members having first and second ends;

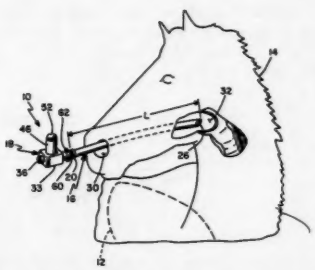
said wing members have a taper such that the first end farther from the orifice is smaller than the second end nearer the orifice.

5,062,423

EQUINE AEROSOL DRUG DELIVERY METHOD AND APPARATUS

Charles J. Matson, and David J. Velasquez, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 27, 1990, Ser. No. 486,609
Int. Cl.[5] A61M *16/00, 15/00, 11/00;* A62B *7/00*
U.S. Cl. 128—207.15 20 Claims



1. A method of delivering a dose of an aerosol drug through the nasal-pharyngeal cavity of a large animal, such as a horse, for administration through its trachea to its lungs, the method comprising the following steps:

inserting a distal end of an endotracheal-like nasal tube through a nostril and nasal cavity of the large animal until the distal end of the nasal tube is positioned within the

nasal-pharyngeal cavity of the animal such that a lumen of the nasal tube communicates through the trachea with the lungs of the large animal; and

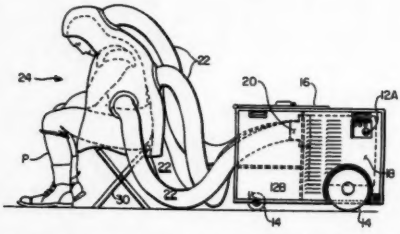
discharging an aerosol drug dose into the lumen of the nasal tube when air flows inwardly through the lumen of the nasal tube toward the lungs for delivery of the drug dose to the lungs of the large animal.

5,062,424

PORTABLE APPARATUS FOR RAPID REDUCTION OF ELEVATED BODY CORE TEMPERATURE

Daniel N. Hooker, Chapel Hill, N.C., assignor to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Filed Jan. 24, 1991, Ser. No. 645,218
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—379 **20 Claims**



1. A manually rolled portable apparatus for rapid cooling of an overheated person comprising:

a container housing movably mounted on a plurality of wheels;

air conditioning means mounted in said container housing for providing a cool air flow;

a garment with an interior and an exterior surface removably stored within said container housing and comprising at least a head covering portion and a torso covering portion; and

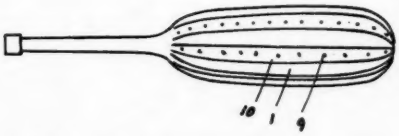
a plurality of flexible air supply hoses fluidly communicating at one end thereof with said air conditioning means and at the other end thereof with the interior surface of said garment.

5,062,425

EXPANSIBLE INTERNAL PRESSURE COLD PACKS AND PERINEAL ICE PAD

Annabelle D. Tucker, 4480 Sherman Oaks Cir., Sherman Oaks, Calif. 91403

Continuation-in-part of Ser. No. 67,084, Jun. 26, 1987, abandoned. This application Sep. 12, 1990, Ser. No. 582,663
Int. Cl.[5] A61F *7/12*
U.S. Cl. 128—401 **10 Claims**



1. An inflatable, expandable device to fit into various contours and sizes of a body cavity for the purpose of providing pressure and cold against traumatized tissue in the prevention of edema, bleeding and hematomas, comprising:

an outer cover comprising an elastic material, said elastic material being expandable and stretchable such that, upon inflation of said outer cover, the elastic material will substantially conform to interior shapes of the body cavity thereabout, said outer cover defining an interior volume therein;

an ice capsule pack comprising inner walls which are enclosed within the interior volume defined by the outer cover, said interior walls also defining a sealed enclosed volume, said enclosed volume having frozen fluid therein such that said inner walls encapsulate the frozen fluid, wherein said frozen fluid is frozen into solid form prior to insertion of said device into the body cavity, wherein said inner walls and said outer cover define a flow path volume therebetween and wherein said device further includes suspension means for attaching said outer cover to a plurality of locations on said inner walls;

access means for allowing a fluid substance to be introduced into said flowpath volume; and

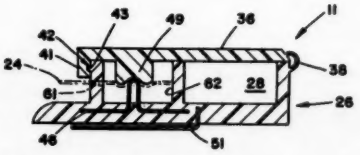
a cold fluid substance within said flowpath volume, said fluid substance being present in a quantity suitable for maintaining the outer cover in an inflated, expanded state having a configuration matching the interior contours of the body cavity.

5,062,426

FETAL HEART MONITOR LEG PLATE ELECTRODE

Paul Ulbrich, Livermore, and Thanh Tran, Union City, both of Calif., assignors to EMS Products, Inc., Bothell, Wash.

Filed Nov. 26, 1990, Ser. No. 618,228
Int. Cl.[5] A61B *5/0448*
U.S. Cl. 128—640 **13 Claims**



12. A leg plate for coupling first and second output wires of a fetal heart rate sensing electrode assembly with a heart rate monitor, comprising:

a base member having a flat underside and a front surface with a raised wall defining a recessed region in said front surface which recessed region including said raised wall has a smaller area than said undersurface and wherein a portion of said base member divides said recessed region into two parallel compartments, said raised wall having a pair of wire receiving notches therein at one end of said recessed region each of which communicates with a separate one of said compartments,

a pair of pivotable cover members each being proportioned to overlay and cover a separate one of said compartments and each being individually hinged to said base member by a thin strip of flexible material which strips are situated at the ends of said compartments that are remote from said notches, each of said cover members having a protrusion which extends down into the underlying compartment when the cover member is pivoted to overlay the compartment, each of said cover members further having means for latching onto said raised wall with a snap action when the cover member is pivoted to overlay said underlying compartment,

said base member and said pair of pivotable cover members and said thin strips of flexible material all being portions of a single integral body of molded plastic material,

a pair of conductive electrical contacts each being partially embedded in said molded plastic material and having an exposed surface which extends into a separate one of said compartments, said exposed surfaces being positioned to be contacted by said output wires when said wires are inserted into said notches and being positioned to exert clamping force on said wires in conjunction with said

cover member protrusions when said cover members are latched onto said raised wall,

a conductive electrode plate secured to said underside of said base member, and

a signal output cable extending from said base member and having a pair of conductors each of which is connected to a separate one of said contacts and an additional conductor which is connected to said electrode.

5,062,427

ULTRASONIC DOPPLER APPARATUS

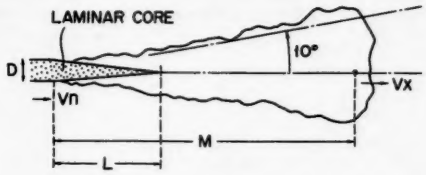
Yasutsugu Seo, Ootawara, and Motoaki Sugawara, 10-14, Higashimine-machi, Oota-ku, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Motoaki Sugawara, Tokyo, both of, Japan

Filed Oct. 19, 1989, Ser. No. 424,337

Claims priority, application Japan, May 6, 1988, 63-110171; Oct. 21, 1988, 63-265518

Int. Cl.[5] A61B *8/06*

U.S. Cl. 128—661.10 **15 Claims**



1. An ultrasonic Doppler apparatus comprising:

fluid imaging means for transmitting ultrasonic waves to a fluid issued from an orifice, receiving reflected echoes thereof, and displaying a tomographic image of the fluid and deriving a Doppler shift frequency of the fluid according to the received echoes;

means for specifying a first point near the orifice on the tomographic image and a second point on a centerline of a portion of the issued fluid other than a laminar core of the issued fluid;

first calculating means for deriving flow velocities at the first and second points based on the Doppler shift frequency derived by said fluid imaging means;

second calculating means for deriving a distance between the first and second points; and

third calculating means for deriving an issuing flow-rate of the fluid based on the flow velocities derived by said first calculating means and the distance derived by said second calculating means.

5,062,428

METHOD AND DEVICE FOR IN VIVO DIAGNOSIS DETECTING IR EMISSION BY BODY ORGAN

Britton Chance, Philadelphia, Pa., assignor to Nim Incorporated, Philadelphia, Pa.

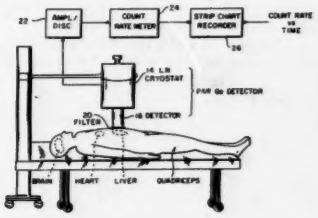
Continuation of Ser. No. 532,142, Jun. 4, 1990, abandoned, which is a continuation of Ser. No. 149,551, Jan. 28, 1988, abandoned. This application Feb. 11, 1991, Ser. No. 653,971

Int. Cl.[5] A61B *6/00*

U.S. Cl. 128—664 **19 Claims**

1. A method for in vivo monitoring of the condition of an internal body organ of a patient, comprising:

detecting photons of electromagnetic radiation caused by the characteristic emission of free radicals from an organ of the patient; and



comparing the rate of said photon detection, signifying the rate of free radical emission, with the expected rate of free radical emission from a healthy organ.

5,062,429

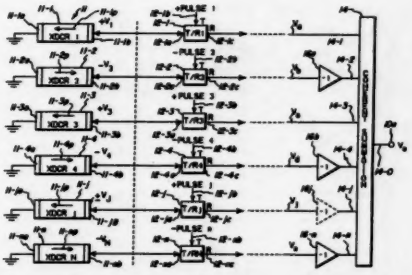
ULTRASOUND IMAGING SYSTEM PROBE WITH ALTERNATE TRANSDUCER POLLING FOR COMMON-MODE NOISE REJECTION

Lowell S. Smith, Schenectady, and Edward J. Piel, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1989, Ser. No. 454,581

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—661.01 **11 Claims**



1. An ultrasonic imaging system having common-mode noise reduction, comprising:

an array of an even-numbered plurality N of transducer means for converting between electric and ultrasonic signals, each assigned to a like-numbered one of a plurality of channels, with the transducer means in (N/2) of the channels being polarized in a direction opposite to the polling direction of the transducer means in the other (N/2) of the channels;

(a plurality N of channel means each for separately processing a received signal from the transducer means of that channel;

a plurality (N/2) of inversion means, each in a different one of the (N/2) channels having transducer means polled in a selected polling direction, for providing an output signal which includes an inverted-polarity version of the processed received signal in that channel; and

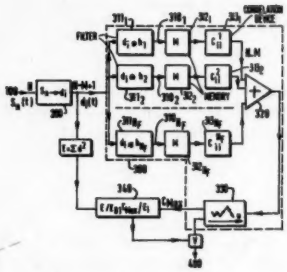
means for summing all inverted-polarity output signals from all of said inversion means and all processed signals from all of the remaining channels, to cause all transducer means signals to be summed while undesired signals commonly present after said transducer means are substantially rejected.

5,062,430

DEVICE FOR MEASURING THE SPEED OF BLOOD FLOWS BY ULTRASONIC ECHOGRAPHY AT AN INCREASED MEASURING SPEED

Odile Bonnefous, Nogent sur Marne, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1990, Ser. No. 518,896
Claims priority, application France, May 12, 1989, 89 06289
Int. Cl.[5] A61B 8/06
U.S. Cl. 128—661.09 8 Claims



1. A device for measuring the speed of blood flow comprising:

M-point fixed-echo elimination means responsive to a sequence of N successive echographic signals applied thereto for producing N−M+1 independent output signals, where M and N are positive integers;

N_F parallel processing channels each comprising filter means for filtering said N−M+1 output signals, memory means for storing the N−M+1 filtered signals, and correlation means responsive to the stored N−M+1 signals for producing a processed signal manifesting N−M intercorrelation functions of said stored N−M+1 signals;

adding means for forming a mean value output signal representing the mean value of the N_F(N−M) intercorrelation functions of the processed signals of said channels; and

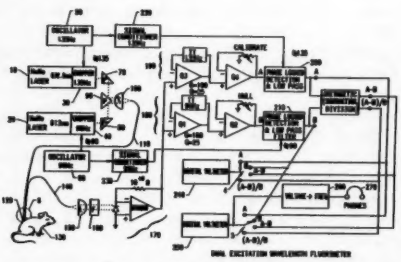
interpolation means responsive to said mean value output signal for providing an estimate of the speed of the blood flow corresponding to said mean value output signal.

5,062,431

IN VIVO FLUORESCENCE PHOTOMETER

William R. Potter, Grand Island, N.Y., assignor to Health Research, Inc., Buffalo, N.Y.

Division of Ser. No. 268,723, Nov. 8, 1988. This application Mar. 30, 1990, Ser. No. 502,447
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—665 3 Claims



1. An apparatus for in vivo detection of abnormal tissue in a patient, comprising:

at least one light source for providing a first light beam having a first wavelength and a second light beam having a second wavelength;

means for imparting characteristics to said first and second beams for differentiating between them;

means for transmitting said first and second beams simultaneously to a diagnostic region of the patient;

means for detecting a fluorescent signal from both the abnormal tissue in the patient and from normal tissue in the vicinity of the abnormal tissue, said fluorescent signal resulting from irradiation of the diagnostic region by said first and second beams and having an intensity related to an amount of each of the normal and abnormal tissue present at the diagnostic region;

means for converting said fluorescent signal to a first electronic signal having a signal strength related to said intensity;

means for electronically differentiating a first portion of said first electronic signal from a second portion of said first electronic signal, by means of said characteristics, where said first portion results from said first incident beam and said second portion results from said second incident beam;

means for generating a second electronic signal relating to a difference in magnitude between said first and second portions of said first electronic signal; and

means for providing said second electronic signal as an output for indicating the presence of abnormal tissue.

5,062,432

METHOD AND APPARATUS FOR MONITORING PERSONAL CORE TEMPERATURE

Paul James, Marietta, Ga.; Theodore J. Kuemmel, Waukesha, Wis.; Michael G. Wurm, Franklin, Wis.; James D. Banach, Milwaukee, Wis., and David Fulton, Pickering, Canada, assignors to LaBelle Industries, Inc., Oconomowoc, Wis.

Filed May 9, 1990, Ser. No. 521,088
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—736 20 Claims

4. An apparatus for monitoring the core temperature of a warm blooded living being, said apparatus comprising:

means for monitoring temperature in the ear canal of the living being;

means for receiving an electronic signal from an orifice temperature sensor, the signal being representative of the core temperature of the living being at a given instant of time;

means for determining the difference between the ear canal temperature and the orifice temperature at the given instant of time; and

means for extrapolating the core temperature of the living being, at a second given instant of time different from the first mentioned instant of time, by using the monitored ear canal temperature at the second given instant of time and the determined difference.

5,062,433

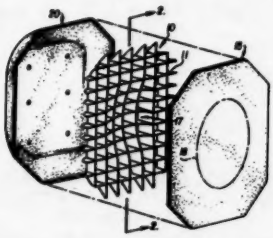
PROTECTOR PAD

Frederick J. Kummer, Brooklyn, N.Y., assignor to Hospital for Joint Diseases, New York, N.Y.

Continuation of Ser. No. 319,613, Mar. 6, 1989, abandoned. This application Jan. 16, 1990, Ser. No. 465,387

Int. Cl.[5] A61F *13/00*

U.S. Cl. 128—888 11 Claims



1. A protector pad for protecting a hip or other area on the body, said protector pad comprising:

(a) a plurality of walls defining a plurality of substantially uniformly shaped rigid cells, said plurality of walls having a length and a width and a thickness, said thickness defining the depth of the cells of said plurality of cells;

(b) said length and said width of said plurality of walls at least exceeding the length and width of a wound or a wound area to be protected by said protector pad; and

(c) wherein the walls defining selected adjacent cells are progressively reduced in said thickness for forming a concave section in said plurality of walls for providing a clearance over said wound or wound area.

5,062,434

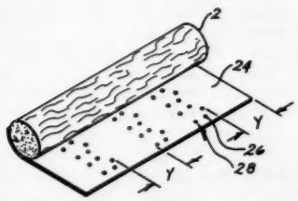
CIGARETTE PAPER

Paul L. Aulbach; Dorothy M. Frank, and David S. Roth, all of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sep. 22, 1989, Ser. No. 411,177

Int. Cl.[5] A24D *1/02*

U.S. Cl. 131—336 5 Claims



1. A cigarette wrapper comprising:

a plurality of at least three rows of perforations extending latitudinally across said paper, said perforations of each row being in alignment with each other, said rows of perforations being spaced apart from adjacent rows by the same preselected distance along the entire length of said paper, and each row of perforations includes a plurality of spaced apart preselected patterns of perforations, each of said patterns being separate and distinct from adjacent patterns, and including a plurality of perforations, and said patterns of each row being in alignment with each other.

5,062,435

HAIR COMB WITH ABSORBANT PAD

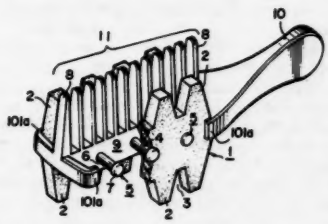
Hiroshi Ohtsuka, Shizuoka, Japan, assignor to Hapyo Yugen Kaisha, Shizuoka, Japan

Filed Jul. 12, 1990, Ser. No. 551,473

Claims priority, application Japan, Jul. 31, 1989, 1-90896[U]; Jul. 31, 1989, 1-90897[U]; Jul. 31, 1989, 1-90898[U]; Jul. 31, 1989, 1-90899[U]

Int. Cl.[5] A45D *24/16*

U.S. Cl. 132—108 7 Claims



2. A hair treating device comprising:

(a) a body made of synthetic resin and having at least one row of comb teeth;

(b) at least one elastic porous absorbing member having teeth formed of concave and convex portions, the pitch between neighboring teeth of said absorbing member being greater than the pitch between neighboring comb teeth of the body;

(c) a connecting structure for supporting the elastic porous absorbing member at an outer side of and in parallel with the row of comb teeth, the connecting structure including a plurality of rows of shafts integrally formed with the body; and

(d) a head disposed on each said shaft and at an outer side of the comb teeth of the body, the elastic porous absorbing member having at least one row of engaging holes, which are smaller than the heads of the shafts, the elastic porous absorbing member being engageable with and detachable from the body.

5,062,436

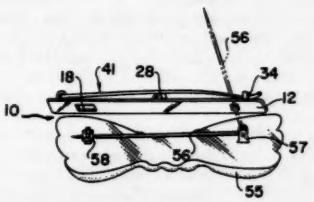
HAIR BARRETTE INCORPORATING AN ORNAMENTAL PIN

David Emsellem, 10300 Glen Rd., Potomac, Md. 20854

Filed Oct. 4, 1989, Ser. No. 417,044

Int. Cl.[5] A45D *8/24*

U.S. Cl. 132—279 29 Claims



1. A hair barrette, comprising:

an elongated main body having a first end, a second end, a longitudinal axis extending between said first and second ends, two side edges and an upper and bottom surface, said main body including a first aperture formed in said first end, said first aperture being dimensioned and positioned so as to receive therethrough either a pivot post or pivot pin clasp of an ornamental pin such that said hair barrette is adapted to maintain the ornamental pin releasably affixed thereto, and the width of said first aperture extending transverse to the longitudinal axis being greater

than the length of said first aperture extending in the direction of the longitudinal axis both on the upper and lower surface of said main body so as to limit longitudinal shifting of either the pivot post or pivot pin clasp of the ornamental pin, said main body further including a second aperture formed in the second end of said main body and spaced from said first aperture so as to receive therethrough either the pivot post or the pivot pin of the ornamental pin;

a clamping member having a first end and second end with said first pivotably attached to one of said ends of said main body, and said clamping member adapted to assure an attached position and a detached position;

attachment means for releasably retaining said clamping member in the attached position; and

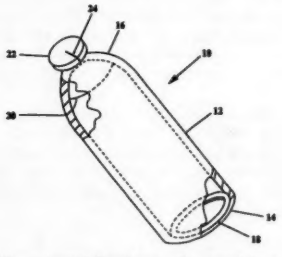
a bridge member attached to said main body and positioned between said first and second ends, said bridge member extending between the two side edges of said main body in a direction transverse to the longitudinal axis extending through the first and second ends of said main body and said first aperture being positioned between said bridge member and one of the ends of said clamping member.

5,062,437

DENTAL FLOSSING TOOL

Robert F. Mason, 10763 Hedda Pl., Cerritos, Calif. 90701

Filed Apr. 2, 1990, Ser. No. 502,800
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—323 **9 Claims**



1. An auxiliary dental flossing tool comprising:

an elongated, generally cylindrical handle member (formed for insertion into a user's mouth to facilitate manipulation of one end of a strand of flossing material during a flossing operation), and

a generally button-shaped disc fixedly mounted on the outside of said handle and forming a floss retaining V-shaped recess between and at the base of said disc and said handle member for releasable frictional retention of a strand of flossing material, (having at least one slot formed therein to frictionally retain a strand of flossing material mounted on the outside of said handle and forming a floss retaining recess between said disc and said handle member for releasable frictional retention of a strand of flossing material) and

at least one non-expandable slot extending part way through said disc to frictionally lock the end of a strand of dental floss within said slot from unwinding.

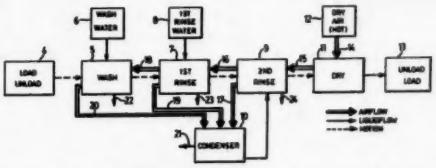
5,062,438

WASHING APPARATUS AND PROCESS

Bejrouth M. Micheletti, 1258 Hollyfield Crs., Oakville, Ontario, Canada L6H 2J6

Filed Sep. 28, 1989, Ser. No. 396,362
Int. Cl.[5] B08B *1/02, 3/04*
U.S. Cl. 134—9 **7 Claims**

1. A method for washing flat, flexible articles, comprising mounting the article on a foraminous belt lying in a vertical position passing the belt bearing the article through a plurality of water washing, rinsing and drying zones, extracting the moisture laden air from at least the said drying zone, condensing the water from the moisture laden air, utilizing the said



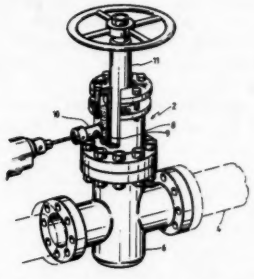
condensed water for rinse water in at least the final of said rinse zones.

5,062,439

METHOD AND APPARATUS TO FACILITATE THE INJECTION OF SEALANT INTO A PRESSURIZED FLUID MEMBER

Johnny L. Butler, Highlands; Richard E. Wakeland, Houston; Donald R. Batson, Dayton, and Robert E. Metzger, Baytown, all of Tex., assignors to Spinsafe, Inc., Highlands, Tex.

Filed Jun. 14, 1990, Ser. No. 537,574
Int. Cl.[5] F16K *43/00, 41/02*
U.S. Cl. 137—15 **14 Claims**



6. A method of injecting a sealant into a chamber formed by a packing assembly of a first valve, comprising the steps of:

attaching a driver cap to a first end portion of a fitting:

rotating said driver cap and fitting at high speed to friction weld a second end portion of the fitting to the exterior of the first valve at an area immediately adjacent the packing assembly chamber;

removing the driver cap from the fitting:

inserting a packing seal into a bore extending into the second end portion of said fitting;

opening a second valve operatively positioned in said fitting bore between said seal and said first end portion;

inserting a boring means through the packing seal, into the bore of said fitting, and through said opened second valve;

completing a bore hole into the packing assembly chamber of said first valve so as to establish fluid communication between the fitting bore and said packing assembly chamber;

withdrawing the boring means a preselected distance along said fitting bore to remove said boring means from said second valve while maintaining contact between said boring means and said packing seal;

closing the second valve in said fitting bore to interrupt fluid communication between said packing assembly chamber and said fitting bore;

removing said boring means from said fitting bore;

coupling to the second end of said fitting means for injecting sealant into the packing assembly chamber of said first valve;

opening said second valve to establish fluid communication

between said packing assembly chamber and said sealant injecting means;

injecting sealant into the packing assembly chamber of said first valve; and

closing said second valve to interrupt fluid communication between said packing assembly chamber and said sealant injecting means.

5,062,440

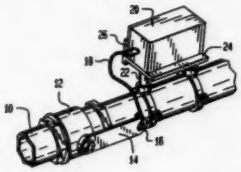
TREMOR-RESPONSIVE SHUT-OFF VALVE

Walter Korabiak, 103 Crine Rd., Morganville, N.J. 07751

Filed Jan. 22, 1991, Ser. No. 644,196

Int. Cl.[5] F16K *17/36*

U.S. Cl. 137—38 8 Claims



1. Apparatus comprising:

a gas or water main;

a ball-cock valve incorporated within said main;

a handle on said valve to controllably open and close said valve;

a stand situated above said handle, having a platform angularly sloped towards said handle; and

an actuator weight coupled to said handle and quiescently resting on said platform;

whereby earthquake tremors of a prescribed magnitude serve to shake said weight off said platform, and in a direction to automatically rotate said handle to close said valve.

5,062,441

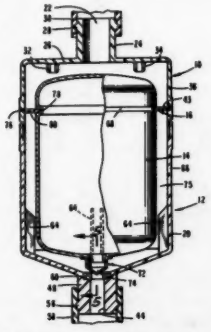
DRAIN VALVE USED IN AIRCRAFT

Michael Glukhov, Encino, Calif., assignor to Sabre Industries, Inc., Burbank, Calif.

Filed Jun. 21, 1990, Ser. No. 541,529

Int. Cl.[5] F16T *1/20, 31/22*

U.S. Cl. 137—81.1 6 Claims



1. In an aircraft having a pressurized cabin and a supply of water that is incrementally and periodically discharged from the aircraft into the outside atmosphere, with the differential in pressure between the cabin pressure and atmospheric pressure increasing as the aircraft attains higher altitudes,

a valve including:

a housing having a water inlet and a water outlet, said water inlet being in communication with the cabin and at the same pressure as in the cabin, with water from the supply being discharged flowing into the valve though said water inlet, and said water outlet being in communication with the outside atmosphere,

a float member retained by a spring means in the form of a rubber, wheel-like member in the housing between the water inlet and water outlet and adapted to move within the housing in response to the aircraft changing altitudes and the water level in the housing,

said float member having at one end a stopper element which is adapted to engage the water outlet and seal the water outlet so that water entering the housing is retained in the housing,

said spring means being biased to move the float member towards the water outlet so that the stopper element engages and seals the water outlet when the aircraft has gained a substantial altitude, and away from the water outlet when the aircraft is at or near ground level.

5,062,442

APPARATUS FOR MONITORING A FLUID CONDUIT SYSTEM FOR LEAKAGE POINTS

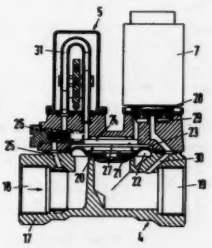
Theiss Stenstrøm; Jens J. Mølbaek, both of Nordborg; Poul E. Hyldig, Augustenborg, and Bjarne Straede, Sydals, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jan. 8, 1990, Ser. No. 461,685

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1989, 3901251; Mar. 7, 1989, 3907209

Int. Cl.[5] G01F *5/00*

U.S. Cl. 137—110 18 Claims



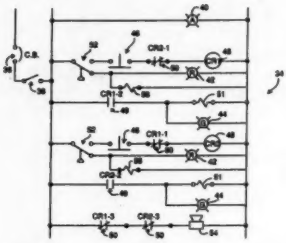
1. Apparatus for monitoring a fluid conduit system for leakage points, comprising a main valve having a housing that includes an inlet, an outlet, and a valve seat interposed between the inlet and outlet, and a fluid flow responsive valve member in the housing operable between an open and a closed position for controlling fluid flow through the valve seat, and volumetric flow meter shunt means for defining a flow shunt flow path that opens to the inlet and outlet, bridging the valve seat and opening to the main valve member for controlling the opening of the valve member as a function of the flow volume in the shunt path and maintaining the main valve member closed until the volume in the shunt path exceeds a predetermined value, the shunt means including a volumetric flow meter for measuring fluid flow through the flow path, an operable shunt valve connected in series with the flow meter between the inlet and outlet for selectively permitting and blocking fluid flow through the flow path, and control means connected and acting at least in part in response to the flow through the flow meter for controlling the operation of the shunt valve.

5,062,443

AUTOMATIC CHANGEOVER MANIFOLD

Radovan R. Maric, Willowdale, Canada, assignor to Union Carbide Canada Limited, Toronto, Canada

Division of Ser. No. 588,936, Sep. 27, 1990, Pat. No. 5,025,824.
This application Mar. 28, 1991, Ser. No. 676,306
Int. Cl.[5] F16K *11/24*
U.S. Cl. 137—113 8 Claims



1. A control circuit for an automatic changeover manifold, comprising:

first pressure-activated switch means for switching electrical energy between a first electrical circuit and a second electrical circuit in parallel with said first electrical circuit,

first solenoid valve control relay means in said first electrical circuit and first signal lamp means in said second electrical circuit,

third electrical circuit in parallel with said first and second electrical circuits, first solenoid valve control relay contact means in said third electrical circuit and activated by said first solenoid valve control relay means, first solenoid valve coil means in said third electrical circuit and second signal lamp means in said third electrical circuit,

second pressure-activated switch means for switching electrical energy between and a fourth electrical circuit and a fifth electrical circuit in parallel with said first to fourth electrical circuits,

second solenoid valve control relay means in said fourth electrical circuit and third signal lamp means in said fifth electrical circuit, and

sixth electrical circuit in parallel with said first to fifth electrical circuits, second solenoid valve relay contact means in said sixth electrical circuit and activated by said second solenoid valve control relay means, second solenoid valve means in sixth electrical circuit and fourth signal lamp means in said sixth electrical circuit.

5,062,444

FUEL LEVEL RESPONSIVE VAPOR VENT VALVE

Rudolph Bergsma, Ann Arbor, Mich., assignor to G. T. Products, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 419,335, Oct. 10, 1989, abandoned.
This application Nov. 5, 1990, Ser. No. 609,365
Int. Cl.[5] F16K *31/22*
U.S. Cl. 137—202 4 Claims

1. A fuel responsive vent valve for venting fuel vapor and air from the fuel tank of the type having a filler tube, said vent valve comprising:

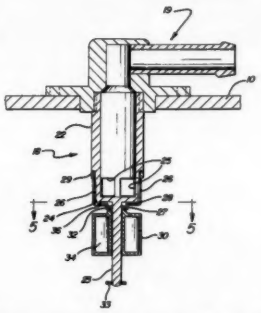
a hollow valve body mounted within the fuel tank communicating with the upper end of the filler tube;

radial port means formed in said valve body communicating with the interior of said fuel tank;

axially slidable shutter means mounted to slide on said valve body between an open position remote from said radial port means and a closed position covering said radial port means;

float means axially slidable on said valve body, said float means responsive to the level of fuel in the fuel tank to raise and lower said shutter means between said open and closed positions;

wherein the valve body defines a first interior surface portion of the shutter means communicating with the interior of the valve body when the shutter means is in the closed position, and a second interior surface portion of the shutter means communicating with the interior of the fuel tank when the shutter means is in the closed position;



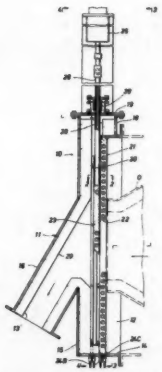
wherein the valve body includes an annular shoulder providing a first seal with the shutter means in the closed position, and an annular flange providing a second seal with the shutter means in the closed position, such that the first interior surface portion of the shutter means is defined between the first and second seals.

5,062,445

WATER COOLED GATE VALVE

Marius R. Junier, Houston, Tex., assignor to Triten Corporation, Houston, Tex.

Filed Aug. 24, 1990, Ser. No. 572,141
Int. Cl.[5] F16K *49/00*
U.S. Cl. 137—340 5 Claims



1. A water cooled gate valve, comprising

a body having an inlet thereto and an insulated side wall in which the outlet is formed,

a plate mounted in the body to extend across the interior thereof adjacent the inlet and spaced from the insulated side wall, said plate having an orifice therethrough,

elongate guide rails mounted in the body between the side wall and plate and at each side of the orifice,

a gate having parallel side edges which extend substantially its entire length and which are guidably slidable within the

guide rails for guided movement within the body and across a side of the plate between positions regulating flow through the orifice,

means on the body for so moving the gate, and

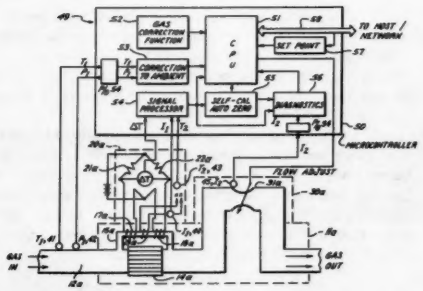
means for circulating water through substantially the entire height and width of each of the orifice plate and gate and length of the guide rails.

5,062,446

INTELLIGENT MASS FLOW CONTROLLER

Richard L. Anderson, Austin, Tex., assignor to Sematech, Inc., Austin, Tex.

Filed Jan. 7, 1991, Ser. No. 638,279
Int. Cl.[5] G05D *7/06*
U.S. Cl. 137—468 **18 Claims**



1. An apparatus for controlling a mass flow of a gas for use in semiconductor processing comprising:

gas metering means having laminar flow coupled to receive said gas at its inlet and for providing a metered flow of said gas at its outlet;

regulating means coupled to said metering means for regulating said flow of said gas provided at said outlet of said metering means;

flow sensing means coupled to said metering means to sense said flow of said gas through said metering means;

a temperature sensor coupled to the inlet of said gas metering means to measure temperature of said gas entering said gas metering means;

a pressure sensor coupled to the inlet of said gas metering means to measure pressure of said gas entering said gas metering means;

processing means coupled to receive gas flow information from said sensing means which is indicative of the flow of said gas and coupled to receive temperature and pressure information from said temperature and pressure sensors;

said processing means also coupled to provide a control signal to said regulating means for controlling a position of said regulating means to provide a desired gas flow from said regulating means;

said processing means further including a software routine stored in its memory for automatically processing said gas flow, temperature and pressure information and adjusting said gas flow based on said temperature and pressure information to correct for ambient variations in order to maintain a selected mass of said gas to flow;

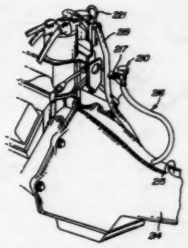
said processing means also including a calibration software routine to provide automatic, in-situ, in process calibration of said gas metering means during initialization of said apparatus.

5,062,447

TRANSMISSION BREATHER CONTROL VALVE AND VENT

Ellard D. Davison, Jr., Grosse Pointe Farms, and Lounes Rabhi, Ypsilanti, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1991, Ser. No. 678,406
Int. Cl.[5] F16K *15/00*
U.S. Cl. 137—493 **1 Claim**



1. A breather control system for an automatic transmission in an engine driven vehicle comprising:

a transmission housing sealed to prevent fluid communication between a cavity within the transmission housing and atmosphere except through a primary valve assembly;

a transmission fill pipe having a sealed closure and inserted into the transmission housing;

the primary valve assembly, being disposed above a level of operating fluid in the transmission housing for both the transmission operating and non-operating modes, restricting passage of gas into and out of the transmission housing, further comprising:

pressure check valve means for relieving gas pressure within the transmission housing cavity by venting the transmission housing cavity to atmosphere when a selected pressure differential between the transmission housing cavity and atmosphere is exceeded;

vacuum check valve means for relieving vacuum within the transmission housing cavity by venting the transmission housing cavity to atmosphere when a selected vacuum differential between the transmission housing cavity and atmosphere is exceeded; and

a common cavity with which the two valve means and the transmission housing are in fluid communication;

means for connecting the primary valve assembly to the transmission housing, providing fluid communication between the primary valve assembly and transmission housing cavity, connecting to the transmission housing at a point above the level of the operating fluid in the transmission housing for both the transmission operating and non-operating modes; and

means for connecting the primary valve assembly to the transmission fill pipe, providing fluid communication between the common cavity of the primary valve assembly and transmission fill pipe, connecting to the transmission fill pipe at a point above the level of the operating fluid in the transmission fill pipe for both the transmission operating and non-operating modes.

5,062,448

DOUBLE ACTION CHECK VALVE

Henry Hilsenbeck, 9951 Sunrise Blvd. R-8, North Royalton, Ohio 44133, and Jack E. Muck, Brookpark, Ohio, assignors to Henry Hilsenbeck, Cleveland, Ohio

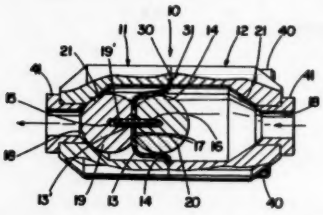
Filed Jun. 14, 1990, Ser. No. 537,584
Int. Cl.[5] F16K *17/26*
U.S. Cl. 137—498 **6 Claims**

1. A valve comprising:

a) a coupling comprising an inlet and outlet member, said

coupling members being rigidly secured together, fluids and gases being adapted to flow through said members;

b) a flexible membrane seating in the coupling members, said flexible membrane being provided with spaced apertures about the perimeter of the membrane and inwardly of the



seating thereof, liquids or gases passing through the apertures in the membrane; and

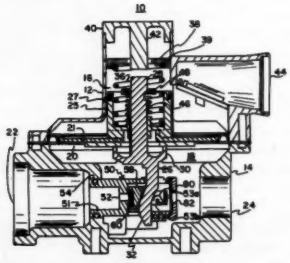
c) valve members carried on either side of the flexible membrane adapted to moderate the flow through the apertures in either direction of the flow and said valve members are truncated spheres with flat bottoms.

5,062,449

VIBRATION DAMPENER FOR DIRECT ACTING PRESSURE REGULATOR

David E. Woollums, Allen, and Donald D. Rice, Wylie, both of Tex., assignors to Fisher Controls International, Inc., Clayton, Mo.

Filed Dec. 28, 1990, Ser. No. 636,082
Int. Cl.[5] G05D *16/06*
U.S. Cl. 137—505.46 **10 Claims**



1. A regulator valve having a body including a spring housing and an inlet and an outlet comprising:

diaphragm means including a diaphragm head;

spring means in said spring housing applying a regulating force to one side of said diaphragm head;

a cylindrical spring cage in said spring housing in engagement with said diaphragm head and coupling said spring means to said diaphragm head;

valve means coupled beaten said inlet and said outlet;

stem means coupled to said diaphragm means and having an end coupled to said valve means for controlling flow from said inlet to said outlet; and

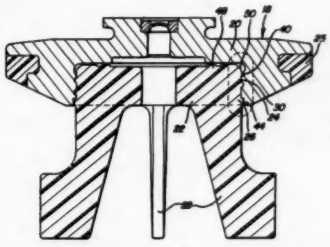
dampener means coupling said spring cage to said spring housing for suppressing vibrations in said regulator valve.

5,062,450

VALVE BODY FOR OILFIELD APPLICATIONS

Thomas F. Bailey, and John E. Campbell, both of Houston, Tex., assignors to MASX Energy Services Group, Inc., Houston, Tex.

Division of Ser. No. 312,855, Feb. 21, 1989, abandoned. This application Oct. 5, 1990, Ser. No. 593,181
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—533.21 **16 Claims**



1. A valve to pump fluids, said valve sealingly cooperating with a valve seat having a throughbore, said valve comprising:

a valve head having an internal cavity;

a valve body attached to said valve head, said valve body having a neck portion received within said cavity of said valve head; and

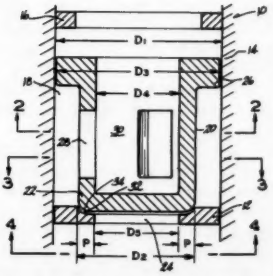
means to lockingly attach said valve body to said valve head, said valve head being made of a metal material and said valve body being made of an elastomer material, said locking means includes cooperating thread forms on said neck portion of said valve body and within said cavity of said valve head thereby preventing inadvertent separation of said valve body from said valve head.

5,062,451

MAXIMUM FLOW SINGLE PLUG RETENTION VALVE

Ammon M. Vadasz, San Antonio de Los Altos, and Jesus E. Chacin, Caracas, both of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Sep. 26, 1990, Ser. No. 588,341
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—533.17 **4 Claims**



1. A check valve comprising a housing having an internal diameter D_1; a seat fixed in said housing, said seat defining a first flow area A_1; a stop fixed in said housing and spaced from said seat so as to define with said housing and said seat a chamber; and a valve plug mounted for reciprocal movement in said chamber, said valve plug having (1) a first diameter portion having a diameter D_2 adapted to mate with said seat for sealing said first flow area A_1, said first diameter portion defining with said housing a second annular flow area A_2, (2) a second diameter portion having an external diameter D_3 and an internal diameter D_4 wherein D_3 is substantially equal to D_1 and D_4

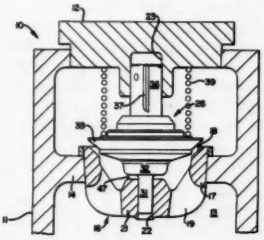
defines a third flow area A_3 and (3) an internal passage connecting A_2 with A_3 wherein said internal passage defines a flow area A_4 wherein A_3 is greater than or equal to A_4 which is greater than or equal to A_2 which is greater than or equal to A_1 whereby the pressure drop across the valve plug is minimized.

5,062,452

VALVE MEMBER AND METHOD OF MAKING SUCH A MEMBER

Jerry E. Johnson, Houston, Tex., assignor to Harrisburg, Inc., Houston, Tex.

Filed Nov. 21, 1990, Ser. No. 616,669
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—533.25 **8 Claims**



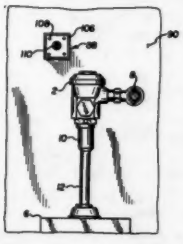
1. A valve member for a one-way check valve including an annular valve seat forming a flow passage, said seat having a central axis, said valve member being movable on said axis relative to said seat, said flow passage having a supply side and a discharge side, said valve member comprising a seal portion an a support portion, said seal portion being made of a relatively soft plastic material and said support portion being made of a relatively rigid plastic material, said soft and rigid plastic materials being compatible and merging along an interface therebetween to form an integral valve member, said seal and support portions extending across said flow passage and said seal portion forming an annular conical seal surface which is engageable with a seal surface of said valve seat, said interface extending closely adjacent said seal surface, said rigid plastic material being on said supply side and said soft plastic material being on said discharge side.

5,062,453

ON DEMAND SENSOR FLUSH VALVE

Robert E. Saadi; Allen R. Becker; Christopher J. Ball, and John Steffan, all of Erie, Pa., assignors to Zurn Industries, Inc., Erie, Pa.

Filed Mar. 6, 1991, Ser. No. 665,344
Int. Cl.[5] E03D *3/08*; F16K *31/00*
U.S. Cl. 137—624.11 **20 Claims**



1. An on demand, non-contact sensor controlled flush alve actuation system comprising:

a flush valve controlling the flow of water between a pressurized water supply and a plumbing fixture, said flush valve including a trip mechanism therein;

an actuator assembly positioned within said flush valve and including a movable piston which is in fluid communication with a control water inlet therethrough;

a control water conduit having one end connected to said flush valve and in constant fluid communication with the pressurized supply water;

a normally closed solenoid operated control valve having an inlet port connected to the other end of said control water conduit and having an outlet port connected to said control water inlet of said actuator assembly;

a radiation generating and sensing unit which immediately generates a first control signal in response to the return reflection of electromagnetic radiation generated therein, said sensing unit having a low sensitivity range so that only deliberate actions of a user will cause the return reflection of said electromagnetic signal; and

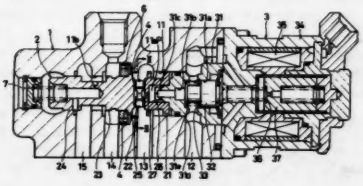
a timer which receives said first control signal and in response thereto immediately generates a second control signal of a predetermined duration, with said second control signal supplied to and activating said solenoid operated control valve, thereby opening said control valve and permitting a portion of said pressurized supply water to flow into said control water inlet and against said piston, with said piston moving from said pressurized supply water and moving said actuator assembly against the trip mechanism and opening the flush valve.

5,062,454

SPOOL CONTROL VALVE

Koji Ichihashi, and Jun-ichi Yasuma, both of Saitama, Japan, assignors to Diesel Kiki Co. L.T.D., Japan

Filed May 23, 1990, Ser. No. 528,063
Claims priority, application Japan, May 24, 1989, 1-59119[U]; Sep. 26, 1989, 1-111708[U]
Int. Cl.[5] F15B *13/043*
U.S. Cl. 137—625.61 **1 Claim**



1. A spool control valve comprising:

a valve housing in which are formed a spool passage and a multiplicity of hydraulic fluid ports in communication with the spool passage;

a spool slidably arranged in the spool passage in the valve housing;

drive means for driving the spool to open and close the hydraulic fluid ports;

wherein communicating passages are formed in the spool which communicate between a first location and a second location in the spool passage, the first location in the spool passage being a portion in communication with a pump port, the second location being a portion in communication with a return port;

wherein the communicating passages in the spool comprise a cross-aperture which extends from the outer peripheral surface facing the pump port in a direction of intersection with the axis of the spool, an orifice which has a smaller cross-section than that of the cross-aperture, and a pilot chamber which is connected to the cross-aperture by the orifice;

wherein a pair of filter elements is disposed in the cross-aperture with the orifice arranged therebetween, each of the

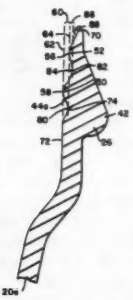
filter elements being inserted into the cross-aperture in a direction of intersection with the axis of the spool.

5,062,455

PRESSURE VESSEL WITH DIAPHRAGM COMPRESSION SEAL

Robert M. Schurter, Elm Grove, Wis., and Robert H. Palmerton, New Dundee, Canada, assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Aug. 25, 1989, Ser. No. 399,596
Int. Cl.[5] F16L *55/04*
U.S. Cl. 138—30 **2 Claims**



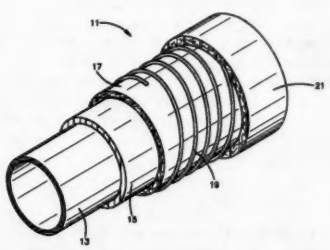
1. A pressure vessel comprising upper and lower cylindrical vessel shells having facing open mouths received one within the other in partially overlapping telescoped relation, said upper shell having a lower wall section received within and overlapping an upper wall section of said lower shell, a flexible resilient diaphragm disposed within said vessel and separating the latter into variable volume chambers, said diaphragm having a peripheral edge received between said lower wall section of said upper shell and said upper wall section of said lower shell, said upper wall section of said lower shell having a top terminal edge and a radially outwardly extending bulge therebelow, said lower wall section of said upper shell having a radial inward transition engaged by said top terminal edge of said upper wall section of said lower shell upon axial telescoped insertion of said shells during assembly, said lower wall section of said upper shell having an inner cylindrical wall portion extending downwardly from said transition and spaced radially inwardly of said bulge, said peripheral edge of said diaphragm having an outer side with a radially outwardly extending bulge received in said bulge of said upper wall section of said lower shell prior to insertion of said upper shell, said peripheral edge of said diaphragm having an inner side engaged by said inner cylindrical wall portion of said lower wall section of said upper shell to radially compress the material of said diaphragm and provide a tight fit of said bulge of said peripheral edge of said diaphragm into said bulge of said upper wall section of said lower shell in sealed relation, said inner side of said peripheral edge of said diaphragm having compression means reducing the amount of diaphragm material requiring compression and also increasing the compression of said bulge of said peripheral edge of said diaphragm in said bulge of said upper wall section of said lower shell to enhance the seal thereat, wherein said compression means comprises one or more internal ribs on said inner side of said peripheral edge of said diaphragm such that said inner cylindrical wall portion of said lower wall section of said upper shell compresses said internal ribs and subjects said bulge of said peripheral edge of said diaphragm to a direct force to provide said increased compression of said bulge of said peripheral edge of said diaphragm, and such that the radial force on said ribs from said inner cylindrical wall portion of said lower wall section of said upper shell is allowed to spread said ribs axially into less compressed areas to enable said reduction in the amount of diaphragm material requiring compression, wherien said bulge of said upper wall section of said lower shell includes a radially inwardly tapered wall portion extending upwardly, and comprising a first said rib radially opposite said tapered wall portion of said upper wall section of said lower shell, and wherein during assembly of said shells, said inner cylindrical wall portion of said lower wall section of said upper shell engages and compresses said first rib to apply a radial outward force compressing said peripheral edge of said diaphragm radially outwardly against said tapered wall portion of said upper wall section of said lower shell which also compresses said peripheral edge of said diaphragm downwardly into the widest radial area portion of said bulge of said upper wall section of said lower shell to enhance the seal thereat, all while still maintaining ease to telescoped assembly of said shells, and comprising a second said rib spaced above said first rib and having an innermost radial inward extension which does not extend as far radially inwardly as the innermost radial inward extension of said first rib, to facilitate said telescoped insertion of said shells during assembly, wherein said inner side of said peripheral edge of said diaphragm includes a lower cylindrical surface extending downwardly below said first rib and spaced therefrom by a valley, and wherein said first and second ribs and spaced by a second valley having an outermost radial outward extension which extends farther radially outwardly than the outermost radial outward extension of said first mentioned valley.

5,062,456

KINK-RESISTANT, SMALL BEND RADIUS HOSE WITH POLYFLUOROCARBON LINER

Horise M. Cooke, Weatherford, and Richard F. Deiss, Arlington, both of Tex., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Mar. 2, 1990, Ser. No. 488,334
Int. Cl.[5] B67L *11/02, 11/08*
U.S. Cl. 138—125 **10 Claims**



1. A kink-resistant, small bend radius hose with a polyfluorocarbon liner comprising:

said polyfluorocarbon liner being a polyfluorocarbon liner tube with a thickness of from about 0.005 inches to about 0.025 inches; said tube having an exterior which is etched to allow silicone to be bonded thereto;

a layer of silicone bonded to said etched exterior of said polyfluorocarbon tube; said layer of silicone being sufficiently thick to allow a silicone impregnated reinforcing fabric to be bonded thereto;

said layer of silicone impregnated reinforcing fabric bonded to said layer of silicone for reinforcing said polyfluorocarbon tube;

a helix strand wound helically about said layer of reinforcing fabric for protecting said hose against kinking; and

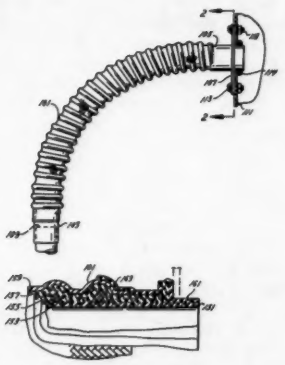
a cover layer bonded to said reinforcing fabric to contain said helix strand with respect to said reinforcing fabric, whereby the combination of said polyfluorocarbon liner tube, said layer of silicone, said reinforcing fabric, said helix strand, and said cover layer form a reinforced hose which is capable of bending to a small bend radius while resisting kinking.

5,062,457

CORRUGATED AIR HOSE ASSEMBLY

Robert W. Timmons, Cypress, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 5, 1989, Ser. No. 347,576
Int. Cl.[5] F16L *11/112*
U.S. Cl. 138—125 3 Claims



1. A duct comprising:

an inner tube having a longitudinal axis, comprising a substantially smooth inner surface, formed of one layer of silicone impregnated cloth;

a non-metallic spiral coil surrounding said inner tube, said longitudinal axis of said inner tube forming the axis about which said spiral coil extends;

an outer tube having at least two layers of silicone impregnated cloth surrounding said spiral coil;

a polyamide protective covering, located concentrically outwardly of, and extending over a substantial portion of said outer tube;

a flange, near at least one end of said duct;

a first section of silicone impregnated cloth, surrounding a portion of said polyamide protective covering and a portion of said outer tube sufficient to hold said polyamide protective coating in place at said one end of said duct having said flange; and,

a second section of silicone impregnated cloth, located between said flange and said one end of said duct, said second section of silicone impregnated cloth surrounding a portion of said outer tube, said flange being formed integral with said first selection of silicone impregnated cloth, said second section of silicone impregnated cloth, and said two layers of silicone impregnated cloth of said outer tube.

5,062,458

ANNULAR VESSEL FOR RECEIVNG RADIOACTIVE SOLUTIONS CONTAINING SOLIDS

Norbert Rohleder, Bruchsal-Obergrombach; Hubert Praxl, Waghäusel, and Dietrich Göbel-Rick, Oberramstadt, all of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hannover, Fed. Rep. of Germany

Filed Mar. 29, 1990, Ser. No. 501,156
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1989, 3910262
Int. Cl.[5] B65B *3/10*
U.S. Cl. 141—80 9 Claims

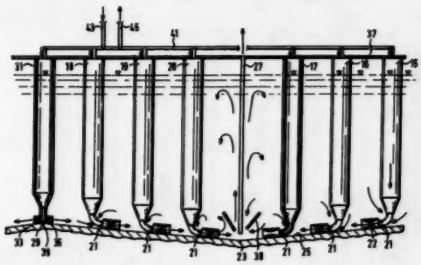
1. An annular vessel arrangement for receiving a radioactive solution containing solids, the annular vessel arrangement comprising:

an annular vessel including a base wall inclined downwardly to a bottom location and mutually adjacent inner and outer side walls extending upwardly from said base wall to define an annular space therebetween for receiving the radioactive solution therein;

discharge means disposed at said bottom location for discharging the solution from said vessel;

a plurality of pulsators arranged in said annular space one next to the other for receiving respective portions of the radioactive solution therein;

air supply means for supplying air under pressure to said pulsators for acting on said portions of radioactive solution;



each of said pulsators extending downwardly into the solution and having a lower end; and,

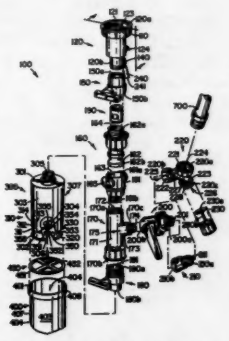
a plurality of outlet nozzles mounted on corresponding ones of the lower ends of said pulsators so as to be substantially parallel to said base wall and positioned so as to direct respective flows of the solution along said base wall toward said bottom location thereby preventing the solids from accumulating on said base wall.

5,062,459

SYSTEM FOR HERMETICALLY DISPENSING AND DILUTING A CONCENTRATED CHEMICAL

Earl H. Schrupp, 7611 36th Ave. N., New Hope, Minn. 55428

Filed May 29, 1990, Ser. No. 529,921
Int. Cl.[5] B67C *9/00*
U.S. Cl. 141—91 16 Claims



1. An assembly for hermetically dispensing a concentrated chemical from a container to a dilution tank, comprising:

a means for hermetically coupling a sealed opening in a container to an opening into a dilution tank,

a means for unsealing the sealed opening in the container after the container has been hermetically coupled to the dilution tank,

an extensible nozzle connected to the coupling means and having a spray head wherein the nozzle is operable for extending the spray head when pressurized fluid is sup-

plied to the spray head into the container through said unsealed opening,

a means for hermetically providing fluid flow from a source of a liquid solvent into the dilution tank, and

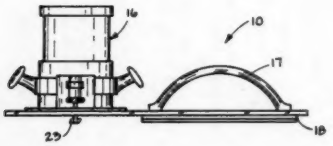
a means for hermetically directing fluid flow from the solvent source into the container through the extensible nozzle for rinsing residual chemical from the container which is then directed into the dilution tank through the unsealed opening in the container.

5,062,460

ROUTER AND GUIDE APPARATUS

Steven K. DeLine, 626 W. Catawba Ave., Mt. Holly, N.C. 28120

Filed Mar. 4, 1991, Ser. No. 663,681
Int. Cl.[5] B27C *5/00*
U.S. Cl. 144—136 C **4 Claims**



1. A router and guide apparatus comprising, in combination,

a transparent base plate, the transparent base plate formed of a rectangular configuration including a rear edge, a forward edge, and spaced parallel side edges, and

a "V" notch guide positioned medially of the forward edge, and

a router bit bore defined by a predetermined diameter directed through the transparent base plate adjacent the forward edge, with the "V" notch guide radially aligned with the router bit bore, and

a router assembly orthogonally mounted to a top surface of the transparent base plate, wherein the router assembly includes a router bit coaxially directed through the router bit bore projecting underlying a bottom surface of the transparent base plate, and

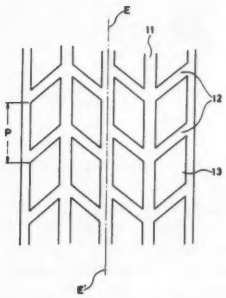
a handle positioned medially of and longitudinally aligned relative to the transparent base plate and radially aligned with the router bit bore and the "V" notch guide.

5,062,461

PNEUMATIC TIRE HAVING A TREAD PATTERN FOR REDUCING NOISE

Makoto Noguchi, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1990, Ser. No. 543,014
Claims priority, application Japan, Jun. 30, 1989, 1-166738
Int. Cl.[5] B60C *11/03*
U.S. Cl. 152—209 R **2 Claims**



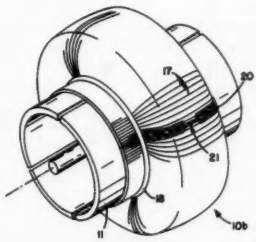
1. A pneumatic tire having a trend pattern on a thread thereof consisting of a plurality of kinds of pitches having different pitch lengths and arranged repeatedly characterized in that said pitches having different pitch lengths, which are to be disposed inside the length of one circumference of said tread, are at least four kinds, the number of pitches having the smallest pitch length in said one circumference is one or two, and the pitch ratio α of the greatest pitch length Pmax to the smallest pitch length Pmin (Pmax/Pmin) is from 1.40 to 1.55; and that the total number of the fundamental periods, each of which is defined as a period from the pitch having the greatest pitch length to a pitch immediately before the next pitch having the greatest pitch length and which is to be disposed inside one circumference of said tread, is at least 6, and the period length ratio β (Tmax/Tmin) of the greatest period length Tmax to the smallest period length Tmin is from 1.20 to 1.80.

5,062,462

PNEUMATIC TIRE MADE BY BUTT-SPLICING STRUCTURAL MEMBERS AND A METHOD THEREFOR

Grover W. Rye, Cuyahoga Falls; David A. Kindry, Clinton, and Carolyn T. Weber, Mogadore, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 19, 1990, Ser. No. 467,715
Int. Cl.[5] B60C *9/02*; B29D *30/06*
U.S. Cl. 152—548 **14 Claims**



1. In a pneumatic tire comprising at least one carcass ply having longitudinal reinforcing members therein disposed over an inner liner, said carcass ply being wrapped around tire beads and having two free ends, wherein

(a) the free ends of said carcass plies abut one another such that side by side longitudinal reinforcing members embedded therein are substantially parallel to said free ends, and a longitudinal reinforcing member next to a free end is next to a longitudinal reinforcing member in an abutting free end, and a splicing strip comprising spun-bonded filaments of synthetic material bridges said free ends of said carcass plies, and

(b) wherein said spun-bonded synthetic material has a density of between about 2.0 oz and 0.6 ox/sq yd and wherein said spun-bonded synthetic material has expansion properties similar to the expansion properties of the carcass plies during the building of the tire.

10. A method of manufacturing a tire comprising the steps of:

(a) disposing a carcass ply on a tire building drum and butt splicing free ends of said carcass play with a splicing strip comprising spun bonded synthetic material bridging the free ends of said carcass ply, said spun bonded synthetic material having expansion properties similar to the expansion properties of the carcass ply during the building of the tire;

(b) applying tread and sidewall rubber; and

(c) vulcanizing the completed structure.

5,062,463

WINDOW CORNICE AND METHOD FOR HANGING CURTAINS

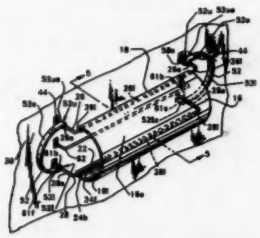
Margaret A. Peters, 1139 Summit Lawn, Wichita, Kans. 67212

Continuation of Ser. No. 426,640, Oct. 30, 1989, Pat. No. 4,966,218, which is a continuation of Ser. No. 173,056, Mar. 25, 1988, Pat. No. 4,922,600. This application Aug. 6, 1990, Ser. No. 563,485

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] E04F *10/00*

U.S. Cl. 160—38 **99 Claims**



11. A window cornice assembly comprising a front plate member generally semi-circular in vertical cross section and having an upper edge and a lower edge; a curtain rod means for supporting at least one generally semi-circular side plate member adaptable to be covered with a fabric, said curtain rod means having an intermediate rod section that is distinct from and secured to said front plate member such that the intermediate rod section extends longitudinally along the front plate member and comprising a first off-set side and a second off-set side both bound to said intermediate rod section with said first off-set side and said second off-set side including ends being adaptable to mount to a wall member; a first generally semi-circular side plate member adaptable to be covered with a fabric, said first generally semi-circular side plate member being secured against said first off-set side; and a second generally semi-circular side plate member adaptable to be covered with a fabric, said second generally semi-circular side plate member being secured against said second off-set side.

5,062,464

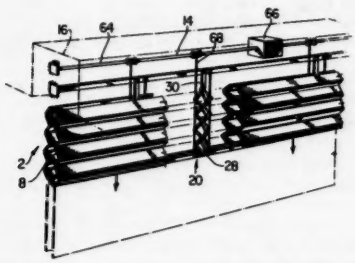
VERTICALLY COLLAPSIBLE WALL PARTITIONS

Miles Peterson, Baie D'Urfe, Canada, assignor to Diesel Kiki Co. Ltd., Baie d'Urfe, Canada

Filed Mar. 25, 1991, Ser. No. 675,549

Int. Cl.[5] E05F *15/00*

U.S. Cl. 160—193 **8 Claims**



1. A rigid wall partition vertically upwardly movable into storage position and vertically downwardly movable to form a wall comprising a support frame of similarly constructed, vertically aligned trains of elongated members, the trains spaced horizontally over a predetermined distance, the members of each train arranged in a single pantograph construction to form a single row of similar-sized vertically stacked diamonds aligned parallel to a desired wall line of the wall, the trains being expandable to a lower, wall-forming position and upwardly liftable to an upper, raised storage position, the diamonds of the trains forming from one train to the next horizontal rows of diamonds, the diamonds in each horizontal row being of similar size and shape, in each train similar pairs of elongated members intersecting and secured pivotally together centrally between their ends to form adjoining vertically disposed apexes of adjacent diamonds and corresponding ends of these pairs of intersecting members pivotally connected to the ends of other pairs of intersecting members to form at those ends laterally disposed apexes of the diamonds so that when the rows are all contracted and the vertical apexes of the diamonds are drawn together, the diamonds are collapsed about their lateral apexes; a pair of similar-sized elongated panel supporting members associated with each of the diamonds, the panel supporting members pivotally secured at one end of each to each other and at their other end to on side of the pantograph opposite respective vertically disposed apexes of that diamond, the panel supporting members being of a length such that they are vertically oriented when the trains are expanded to a predetermined limit; similar, rigid panels being secured to a panel support member of each train at the corresponding height in a horizontal row with different panels secured at different heights so that the panels extend laterally horizontally over said predetermined distance, and provide a continuous wall surface when the panel support members are in vertical orientation; a first horizontally oriented beam member joining the trains at their bottom and a second horizontally oriented beam member joining the trains at their top; mechanical means associated with the first horizontally oriented beam member and actuable to cause the first beam member to lift while maintaining its horizontal orientation, the diamonds to collapse at the same rate as the first beam is lifted to upper, storage position.

5,062,465

PROCEDURE FOR CONVEYING MOLDS, AND A PLANT FOR THAT PURPOSE

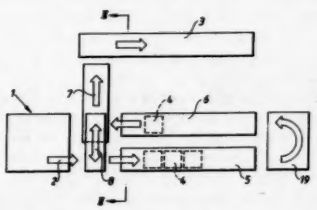
Anders Mortensen, Brønshøj, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Oct. 9, 1990, Ser. No. 596,715

Claims priority, application Denmark, Oct. 16, 1989, 5132/89

Int. Cl.[5] B22C *11/08*; B22D *47/02*

U.S. Cl. 164—4.1 **5 Claims**



1. In a method for conveying molds from the delivery end of a molding machine to a cooling conveyor or an extractor station, wherein the molds are conveyed in a direction away from the molding machine in close mutual contact with each other on a first conveyor at which pouring takes place, and are then conveyed back in the direction of the molding machine on a second conveyor which extends parallel to said first conveyor and on which initial cooling and solidification take place, whereupon the molds with partially cooled castings formed therein are ejected onto the cooling conveyor or to the extractor station by the action of a reciprocating ejector element which is adapted to move the molds transversely away from the second conveyor, the improvement comprising controlling the molds delivered by the molding machine by ejecting defective molds having irregularities or flaws therein trans-

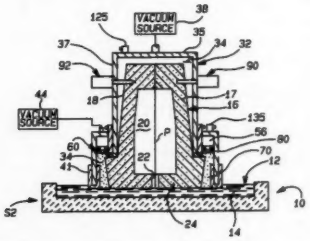
versely from the first conveyor in the direction of the second conveyor immediately upon leaving the molding machine and thereafter conveying the defective molds to the cooling conveyor or the extractor station by the action of the ejector element.

3. In a molding plant comprising a molding machine having a delivery end, a first conveyor, having an entry end to receive molds delivered from the delivery end of the molding machine, for conveying the molds in closely held together end-to-end relation, and along which conveyor pouring is carried out to produce poured castings, a turning station on which the molds are turned individually through 180°, and a second conveyor having an exit end on which the molds and poured castings are cooled while the closely held together molds are conveyed back towards the molding machine, a mold ejector means at the exit end of the second conveyor for moving the molds to a cooling conveyor or an extractor station, the improvement comprising a cross-conveyor means, located at the delivery end of the molding machine, for, together with the ejector means, moving defective molds directly from the entry end of the first conveyor to the cooling conveyor or the extractor station.

5,062,466
COUNTERGRAVITY CASTING APPARATUS AND METHOD

John G. Kubisch, Midland; James B. Mercer, Saginaw; Wilmer G. Schaeff, Saginaw, and Thomas E. Wenzel, Saginaw, all of Mich., assignors to General Motors Corporation Detroit, Mich.

Filed May 10, 1991, Ser. No. 698,560
Int. Cl.[5] B22D *18/06*
U.S. Cl. 164—7.1 **23 Claims**



1. Countergravity casting apparatus, comprising:

a) a casting mold having a mold cavity for receiving melt and a melt inlet communicating said mold cavity with a lower mold portion adapted to engage an underlying source of said melt,

b) a container having a depending skirt and defining a chamber with an open bottom end, said container engaging said mold such that said chamber confronts the mold so as to form an open bottom peripheral space defined by said skirt and said lower mold portion,

c) a sealing gasket disposed between the mold and the container above said lower mold portion,

d) particulates disposed in said peripheral space between said sealing gasket and said lower mold portion, and

e) means for establishing a negative differential pressure between the inside and the outside of said peripheral space sufficient to hold the particulates therein such that the particulates thermally isolate said sealing gasket from heat from and contact with said source.

13. In a method of countergravity casting a melt, the steps of:

a) positioning a mold having a mold cavity communicated to a lower mold portion by a melt inlet in a container having a chamber with an open bottom end such that said chamber confronts said lower mold portion as to form an open bottom peripheral space about said lower mold portion,

b) positioning a sealing gasket between the mold and the container above said lower mold portion,

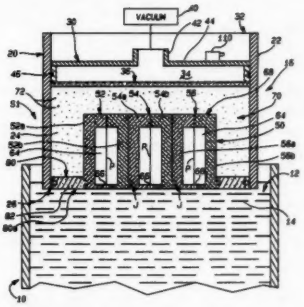
c) disposing particulates in the peripheral space between said sealing gasket and said lower mold portion, and

d) establishing a sufficient negative pressure between the inside and the outside of said peripheral space to hold the particulates therein such that said particulates thermally isolate said sealing gasket from heat from and contact with an underlying source of the melt when said lower mold portion is engaged to said source for casting.

5,062,467
VACUUM COUNTERGRAVITY CASTING APPARATUS AND METHOD

John G. Kubisch, Midland, and Paul D. Wilczynski, Bay City, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 10, 1991, Ser. No. 698,140
Int. Cl.[5] B22C *9/02, 9/04;* **B22D** *18/06*
U.S. Cl. 164—7.1 **35 Claims**



1. Apparatus for countergravity casting of a melt, comprising:

a) a container having a peripheral wall defining a chamber having an open bottom end,

b) means disposed in the chamber for forming a mold cavity and melt inlet for communicating the mold cavity with an underlying source of the melt,

c) a first inherently unstable mass of particulates disposed in the chamber about the mold cavity and inlet-forming means, and

d) a second supportive mass of bonded particulates disposed in the container about the mold cavity and inlet-forming means beneath said first mass for supporting said first mass in the chamber as the container and source are relatively moved toward/away from one another for communicating/discommunicating said mold cavity and said source, as appropriate, for casting.

24. A method of countergravity casting a melt, comprising the steps of:

a) disposing a container about means for forming a mold cavity and a melt inlet beneath said mold cavity such that an open bottom end of the container is disposed proximate the melt inlet,

b) providing a first inherently unstable mass of particulates about the mold cavity and inlet-forming means in the container,

c) providing a second mass of bonded particulates about the mold cavity and inlet-forming means in the container such that, when the container is oriented to position said melt inlet facing the underlying source of the melt, said first mass is disposed atop said second mass and is supported in the container by said second mass,

d) relatively moving the container and the source to engage said melt inlet and said source, and

e) drawing the melt upwardly toward the melt inlet into the

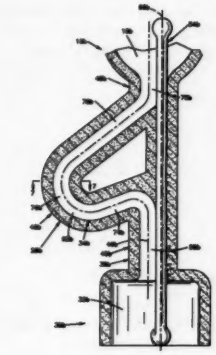
mold cavity when said melt inlet and said source are engaged.

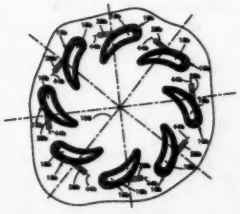
5,062,468

MOLD AND METHOD FOR CASTING A SINGLE CRYSTAL METAL ARTICLE

Louis H. Monte, Minerva; Arunachalam Jeyarajan, Euclid, and Lawrence D. Graham, Chagrin Falls, all of Ohio, assignors to PCC Airfoils, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 382,729, Jul. 19, 1989, Pat. No. 4,940,073, and a continuation-in-part of Ser. No. 542,436, Jun. 22, 1990. This application Jul. 3, 1990, Ser. No. 547,287
The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.
Int. Cl.[5] B22C 9/04
U.S. Cl. 164—122.2 48 Claims





1. A mold for use in casting a single crystal metal article, said mold comprising article mold means for defining an article mold cavity having a configuration corresponding to the configuration of the article to be cast, starter means for defining a starter cavity in which molten metal solidifies, and selector means extending between an upper end portion of said starter means and a lower end portion of said article mold means for at least partially defining a crystal selector passage which extends between said starter cavity and said article mold cavity and from which a single crystal of metal solidifies upwardly into said article mold cavity, said selector means including a lower section connected with said starter means and in which a lower portion of said selector passage extends away from said starter cavity, an upper section connected with said article mold means and in which an upper portion of said selector passage extends downwardly away from said article mold cavity and a connector section connected with said upper and lower sections of said selector means, said connector section of said selector means including an entry section in which a first portion of said selector passage slopes downwardly away from an upper end of said lower portion of said selector passage, a single bend section in which a single bend portion of said selector passage extends upwardly away from a lower end of said first portion of said selector passage, and an exit section in which a second portion of said selector passage slopes upwardly from an upper end of said single bend portion of said selector passage to a lower end of the upper portion of said selector passage.

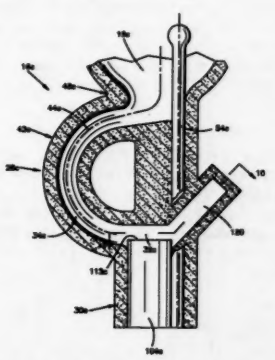
31. A method of casting a single crystal article, said method comprising the steps of initiating solidification of a plurality of crystals of metal in a starter cavity, growing crystals of metal from the starter cavity along a selector passage, said step of growing crystals of metal along a selector passage including growing one or more crystals of metal along a downwardly sloping portion of the selector passage and, thereafter, growing one or more crystals of metal along an upwardly extending portion of the selector passage, and growing only one crystal of metal from the selector passage into an article mold cavity.

5,062,469

MOLD AND METHOD FOR CASTING A SINGLE CRYSTAL METAL ARTICLE

Louis H. Monte, Minerva; Arunachalam Jeyarajan, Euclid, and Lawrence D. Graham, Chagrin Falls, all of Ohio, assignors to PCC Airfoils, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 382,729, Jul. 19, 1989, Pat. No. 4,940,073. This application Jun. 22, 1990, Ser. No. 542,436
The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.
Int. Cl.[5] B22D 9/04
U.S. Cl. 164—122.2 24 Claims



1. A mold for use in casting an article as a single crystal having selected primary and secondary orientations, said mold comprising article mold means for defining an article mold cavity having a configuration corresponding to the configuration of the article to be cast, starter means for defining a starter cavity in which molten metal solidifies as one or more crystals, said starter means including means for holding a single crystal seed with a primary orientation axis parallel to the selected primary orientation axis of the single crystal article and a secondary orientation axis parallel to the selected secondary orientation axis of the single crystal article when the single crystal article is cast in the mold cavity, and selector means extending between an upper portion of said starter means and a lower portion of said article mold means for at least partially defining a crystal selector passage which extends between said starter cavity and said article mold cavity and from which a single crystal of metal having a primary orientation and a secondary orientation which correspond to the selected primary and secondary orientations of the single crystal article solidifies upwardly into said article mold cavity, said selector means includes a lower section connected with said starter

means and in which a lower portion of said selector passage extends upwardly away from an upper end portion of said starter cavity, an upper section connected with said article mold means and in which an upper portion of said selector passage extends downwardly away from a lower end portion of said article mold cavity, a single arcuate bend section connected with said upper and lower sections and in which a single arcuate bend portion of said selector passage extends between an upper end of the lower portion of said selector passage and a lower end of the upper portion of said selector passage, said upper and lower portions and said single arcuate bend portion of said crystal selector passage having a longitudinal central axis at least a portion of which extends transversely to a vertical central axis of the starter cavity, said longitudinal central axis of said upper and lower portions and said single arcuate bend portion of said selector passage being disposed in a single vertical plane which is parallel to a plane containing the selected primary orientation axis of the single crystal article and the selected secoadary orientation axis of the single crystal article when the single crystal article is cast in said article mold cavity.

21. A method of casting an article as a single crystal, said method comprising the steps of conducting a flow of molten metal through an article mold cavity to a starter cavity containing a single crystal seed, thereafter, removing contaminants from the upper side surface of the single crystal seed by conducting an initial portion of the flow of molten metal from the article mold cavity across an upper side surface of the single crystal seed, said step of conducting an initial portion of the flow of molten metal from the article mold cavity across the upper side surface of the single crystal seed including conducting the flow of molten metal across the upper side surface of the single crystal seed from one edge portion of the seed to the opposite edge portion of the seed in a stream having a direction of flow which is generally parallel to the upper side surface of the single crystal seed throughout the extent of the upper side surface of the single crystal seed, and removing the contaminants from the starter cavity by conducting the initial portion of the flow of molten metal to a contaminant receiving chamber which is spaced from the mold cavity.

5,062,470

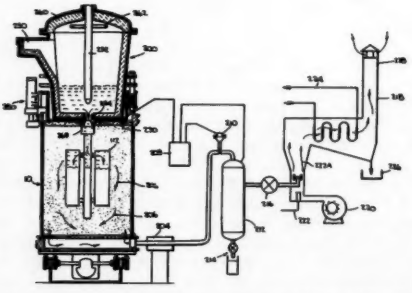
METHOD AND APPARATUS FOR TREATING GASEOUS MATERIAL FROM EVAPORATIVE PATTERN CASTING

Leslie D. Rikker, 15441 Betty Ann La., Oak Forest, Ill. 60452

Division of Ser. No. 181,443, Apr. 14, 1988, Pat. No. 4,947,923. This application Mar. 28, 1990, Ser. No. 501,528

Int. Cl.[5] B22D *27/15, 46/00*

U.S. Cl. 164—457 **10 Claims**



1. A method for processing gaseous material resulting from the evaporation of a pattern by the heat energy molten metal as the molten metal displaces the pattern, said pattern being surrounded by packed unbound molding medium within a container, said method comprising the steps of:

removing the resulting gaseous material from within said container as said gaseous material permeates through the packed unbound molding medium;

said step of removing comprising controlling the outflow of said gaseous material to control the rate of displacement of the pattern by the molten metal;

cleaning and cooling the removed gaseous material thereby forming condensate and detoxified gas;

discharging said condensate; and

discharging said detoxified gas.

6. Apparatus for processing gaseous material resulting from the evaporation of a pattern by the heat energy of molten metal as the molten metal displaces the pattern surrounded by packed unbound molding medium within a container, said apparatus comprising:

means for removing the resulting gaseous material from within said container as said gaseous material permeates through the packed unbound molding medium, said means for removing comprising means for controlling the outflow of said gaseous material to control the rate of displacement of the pattern by the molten metal;

means for cleaning and cooling the removed gaseous material thereby forming condensate and detoxified gas;

means for discharging said condensate; and

means for discharging said detoxified gas.

5,062,471

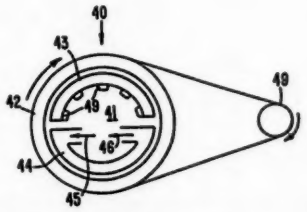
HEAT TRANSFER SYSTEM WITHOUT MASS TRANSFER

Marc J. Jaeger, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Division of Ser. No. 397,407, Aug. 23, 1989, Pat. No. 5,004,041, which is a division of Ser. No. 199,355, May 26, 1988, Pat. No. 4,880,049. This application Dec. 19, 1990, Ser. No. 630,201

Int. Cl.[5] F32D *19/04*

U.S. Cl. 165—8 **1 Claim**



1. A heat-transfer system comprising:

at least a pair of zones constructed of heat-conductive material, each of said zones having a first solid surface adapted for positioning at respective locations of differing temperatures between which it is desired to transfer heat and each having a second solid, continuous surface adapted to slidably engage the interior solid surface of a cylindrical element rotating about its longitudinal axis;

a cylindrically hollow element having at least the interior solid cylindrical surface thereof constructed of a heat-conductive material and being positioned such that the said interior solid cylindrical surface thereof slidably engages said second solid, continuous surfaces of said zones when rotated about the longitudinal axis of said cylinder; and

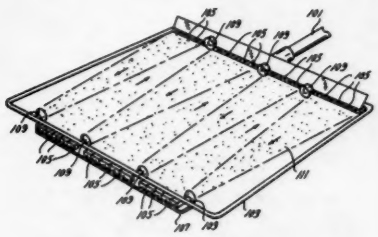
means for establishing rotation of said element about the longitudinal axis of said cylinder.

5,062,472

TURBULENT DROPLET GENERATOR WITH BOOM MOUNTED PITOT PUMP COLLECTOR

James B. Blackmon, Irvine, and Robert E. Drubka, Huntington Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 23, 1989, Ser. No. 356,055
Int. Cl.[5] F28D *15/00*; B64G *1/50*
U.S. Cl. 165—41 15 Claims



1. A heat rejection system comprising:

a cooling fluid ejection apparatus including:

housing means for accepting the flow of a heated coolant fluid, said housing means having a generally rounded orifice;

flow distribution means, fittable within said orifice of said housing means, for facilitating wide distribution of said heated coolant fluid flowing through the cross section of said orifice between said flow distribution means and said housing means, said flow distribution means positionally adjustable within said housing means to thereby control the flow rate of said fluid even to the extent of total shut-off; and,

turbulence generating means, integral with the outer surface of said flow distribution means, for facilitating the dispersion of fluid ejected from said fluid ejection means;

fluid collection means for capturing the flow of coolant fluid;

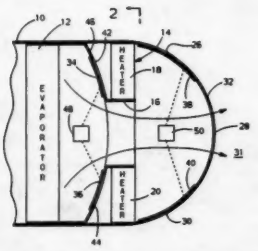
fluid collection support means, connected to said fluid collection means and said fluid ejection means, for facilitating operation of said fluid collection means, and providing a return path for said cooling fluid.

5,062,473

MOTOR VEHICLE PASSENGER COMPARTMENT HEATING, VENTILATING AND AIR CONDITIONING SYSTEM

James C. Ostrand, Armada, and William L. Drayer, Romeo, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 18, 1990, Ser. No. 539,398
Int. Cl.[5] F24F *11/02, 13/08*; B60H *3/00*
U.S. Cl. 165—42 3 Claims



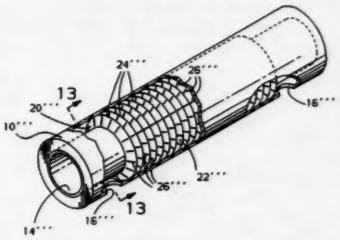
1. A motor vehicle passenger compartment heating, ventilating and air conditioning system comprising an air duct having an inlet and at least three outlets, an evaporator mounted in said duct, a split heater continuously receiving engine coolant mounted in said duct in a singular duct portion between said evaporator and said outlets, said heater having an opening therethrough aligned with one of said outlets, said heater having heat transfer zones located on opposite sides of said opening, said heater opening and heat transfer zones together composing the entire cross-sectional flow area of said singular duct portion, the others of said outlets located in a path downstream of the respective heat transfer zones, mode door means for opening said one outlet while closing said other outlets and vice versa, and air temperature door means for opening said heater opening while closing said heat transfer zones and vice versa.

5,062,474

OIL COOLER

Shrikant M. Joshi, Getzville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 527,459, May 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 470,504, Jan. 26, 1990, Pat. No. 4,945,981. This application Jan. 8, 1991, Ser. No. 638,972
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] F28F *13/12*
U.S. Cl. 165—109.1 2 Claims



1. An oil cooler for transferring heat from oil within the cooler to fluid without the cooler, comprising:

a pair of tubular members secured together at their ends and concentrically arranged to form an oil flow path therebetween, inlet and outlet ports in one of said members to define the general direction of oil flow,

an oil center between the tubular members in thermal contact with the tubular members and in the oil flow path for transferring heat from the oil to the tubular members,

the oil center comprising a corrugated metal sheet having a plurality of substantially plane fins in side-by-side relationship and joined at bends wherein the bends make the thermal contact with the tubular members,

a plurality of louvers in each fin for creating turbulence in the oil flow and defining openings in the fins, and

the oil center being disposed with the direction of the fin planes transverse to the general direction of flow so that the oil passes through the openings in the fins in passing from the inlet port to the outlet port.

5,062,475

CHEVRON LANCED FIN DESIGN WITH UNEQUAL LEG LENGTHS FOR A HEAT EXCHANGER

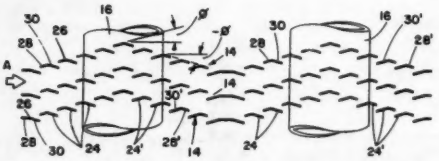
Charles H. Bemisderfer, Granger, Ind., and James A. Wanner, Rockford, Ill., assignors to Sundstrand Heat Transfer, Inc., Dowagiac, Mich.

Filed Oct. 2, 1989, Ser. No. 415,950
Int. Cl.[5] F28D *1/04*
U.S. Cl. 165—151 13 Claims

6. A heat exchanger fin adapted for use in a fin and tube type heat exchanger comprising tubes conveying a first heat ex-

change fluid and wherein said tubes pass through a plurality of fin plates with air flow passing over the fin plates being along an air flow axis substantially parallel to the major plane of the fin plates, said fin comprising:

a thin plate of thermally conductive material having angled louvers formed from said fin plate with the length of said louvers lying substantially perpendicular to said air flow axis and the width of said louvers being along said air flow axis, wherein said louver width consists of a short leg and a longer leg;



said fin plate having first areas upstream in the direction of air flow relative to a first row of said tubes and second areas downstream relative to said first row of said tubes; and

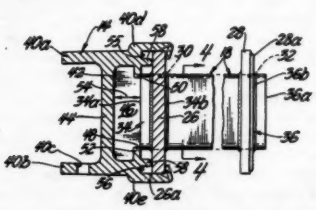
said fin plane being corrugated with convolutions of said plate in said first area being bent from the air flow axis a first direction and convolutions of said plate in said second areas being bent from the air flow axis in the opposite direction, said longer leg being bent in an acute angle from the plane of said convolutions and said short leg being in said plane of said convolutions of said fin plate.

5,062,476

HEAT EXCHANGER WITH AN EXTRUDED TANK

Richard P. Ryan, East Amherst; Glenn W. Shaffer, Middleport; Gary A. Halstead, Lockport; David M. Smith, Amherst, and Shrikant M. Joshi, Getzville, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1991, Ser. No. 661,963
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—173 **6 Claims**



1. A heat exchanger assembly having a pair of spaced unitary members;

each of said unitary members having tank means;

a plurality of tube members extending between said unitary members for communicating each of said tank means in fluid flow relationship;

each of said tube members having opposite end surfaces thereon;

header means engaged to said tube members for sealing against fluid leakage along said opposite end surfaces and for locating said tube members in spaced relationship to one another lengthwise of said unitary members; said header means having an inboard surface and an outboard surface;

said unitary members each having a pair of seal ribs thereon engaged with said inboard surface for sealing against fluid leakage from said tank means;

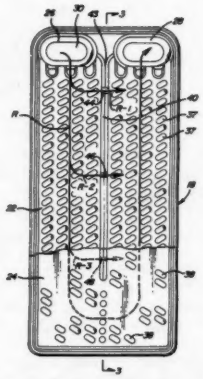
and integral tab means on said unitary members bent against said outboard surface to join said header means to said unitary members.

5,062,477

HIGH EFFICIENCY HEAT EXCHANGER WITH DIVIDER RIB LEAK PATHS

Prasad S. Kadle, Getzville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 29, 1991, Ser. No. 677,193
Int. Cl.[5] F28D *1/03*
U.S. Cl. 165—174 **4 Claims**



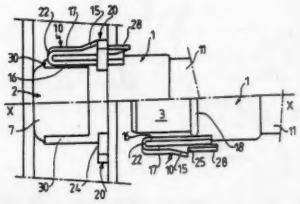
3. A heat exchanger having a plurality of flattened tubes operatively interconnected together to provide passage for conducting a volatile heat exchanger fluid therethrough, connector means for interconnecting said tubes so that air can flow between tubes which are adjacent to one another, said tubes having a leading edge and a trailing edge and flattened side portions that are laterally spaced from one another, a rib in each of said tubes for separating said tubes into an intake side and an outlet side for said heat exchanging fluid, said intake side of said tubes providing a leading edge of a core so to receive air therebetween, said outlet side of said core providing a trailing side of said core for discharging air therefrom, and bypass means in each said core rib for transmitting a portion of said volatile heat exchanger fluid from said intake side to said outlet side so that said heat exchanger fluid will have volatile fluid in each said tube downstream of said intake side to increase the potential for heat transfer because of the latent heat of vaporization.

5,062,478

SNAP-FASTENING ASSEMBLY DEVICE FOR MOTOR VEHICLE HEAT EXCHANGERS

Michel Potier, Rambouillet, and Gilles Briet, Gueugnon, both of France, assignors to Hutchinson, S.A., Paris and Valeo Thermique Moteur, S.A., Le Mesnil-Saint-Denis, both of, France

Filed Apr. 30, 1990, Ser. No. 516,331
Claims priority, application France, May 5, 1989, 89 05976
Int. Cl.[5] F28F *9/00;* **F16L** *37/133*
U.S. Cl. 165—178 **5 Claims**



1. An assembly device for a heat exchanger and tubular

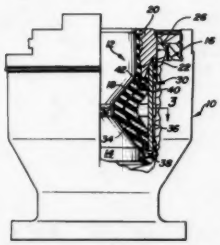
connector assembly, in which the tubular connector opens out into an opening in a tank of the heat exchanger and is fixed firstly to a flexible hose by a permanent connection and secondly to the tank via an easily disassembled resilient connection, with sealing between the tubular connector and the tank being provided by an elastomer ring which is radially compressed therebetween, the tubular connector and the tank being in alignment along an assembly axis and constituting two parts to be assembled by snap fastening at least one axially-directed tab carried on one of the two parts, said tab being radially resilient and provided with a snap-fastening catch, said catch engaging axial abutment means carried by the other one of the two parts, said radially resilient tab thus serving as an expansion spring whose resilient reaction acts in a radial direction tending to maintain the tab pressed against the abutment means when the said two parts are in the assembled position, wherein said tab is in the form of a leaf spring comprising a first branch and a second branch which are substantially parallel to each other and to the assembly axis, with the first branch projecting from one of the two parts in the assembly direction while the second branch projects from the axially inner end of the first branch in opposite direction to the assembly direction, such that the tab is generally U-shaped, with the catch projecting radially outwards from the second branch of the tab.

5,062,479

STRIPPER RUBBERS FOR DRILLING HEADS

Thomas F. Bailey, and Larry F. Moeller, both of Houston, Tex., assignors to MASX Energy Services Group, Inc., Houston, Tex.

Filed Jul. 31, 1990, Ser. No. 560,526
Int. Cl.[5] E21B *33/03, 33/08*
U.S. Cl. 166—84 **22 Claims**



1. A stripper rubber for use in a well drilling head having a drill string selectively extending therethrough, said stripper rubber comprising:

a stripper body having an axial passageway, said stripper body selectively sealingly engaging the drill string extending through said axial passageway and the drilling head; and

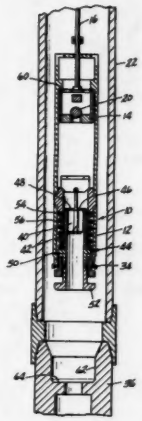
means for restraining said stripper body against deformation within the drilling head, said means including an integral drive bushing incorporated into an upper end of said stripper body and at least one longitudinal support member extending between said drive bushing at said upper end of said stripper body and a lower end of said stripper body to restrain said lower end of said stripper body against deformation into said axial passageway.

5,062,480

SELF ACTUATED INTAKE VALVE ASSEMBLY FOR INSERT SUBSURFACE RECIPROCATING PUMPS

Jesus E. Chacin U., Caracas, and Amnon M. Vadasz F., Urb. Club de Campo, both of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Oct. 11, 1990, Ser. No. 597,203
Int. Cl.[5] E21B *43/16*; F04B *21/06*
U.S. Cl. 166—108 **9 Claims**



1. In a deep well having a production tube and a sucker rod operated reciprocating subsurface pump which is selectively positioned between a first position wherein said pump is anchored in said production tube for pumping fluid from the well and a second position wherein said pump is unanchored in said production tube for non-pumping operations wherein said pump comprises a pump barrel having first valve seat defining an inlet port and a second valve seat defining an outlet port, an inlet valve for selectively sealing said inlet port and an outlet valve for selectively sealing said outlet port and a plunger reciprocally mounted within said pump barrel for pumping fluid from said inlet port to said outlet port, the improvement which comprises said inlet valve includes means for locking said inlet valve against said inlet port for sealing same against pressure downhole in the well when said pump is in said second position so as to prohibit passage of fluid into said pump barrel and unlocking said inlet valve so as to allow for selective sealing and unsealing of the inlet port when said pump is in said first position for pumping fluid from said well.

5,062,481

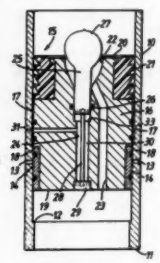
CONTROL OF 'U' TUBING IN THE FLOW OF CEMENT IN OIL WELL CASINGS

Paul D. M. Gullett, Grantham, United Kingdom, assignor to Sterling Design International, Newark, United Kingdom

Filed Oct. 3, 1990, Ser. No. 592,450
Claims priority, application United Kingdom, Oct. 3, 1989, 8922302
Int. Cl.[5] E21B *17/14, 33/16*
U.S. Cl. 166—153 **20 Claims**

1. A device for preventing 'U' tubing in the flow of fluid in oil well casings comprising a body for sealing engagement with an interior of a casing string towards an end thereof and having opposed end walls, a passage extending between said end walls for passing fluid under pressure from a supply thereof to the end of the casing, a member being arranged in said passage to move from a first position in which fluid flow through said passage is permitted and a second position in which said flow

is reduced when the pressure in the flow of the fluid exceeds a predetermined value likely to cause the commencement of 'U'



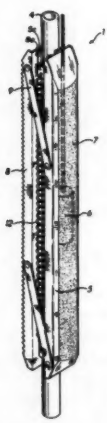
tubing, said member returning to said first position when said pressure reduces below the said predetermined value.

5,062,482

PIEZOMETER ACTUATOR DEVICE AND METHOD FOR ITS INSTALLATION IN A BOREHOLE

John P. Graham, Edmonton, Canada, assignor to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Filed Aug. 7, 1989, Ser. No. 390,011
Int. Cl.[5] E21B *47/00*
U.S. Cl. 166—250 **2 Claims**



1. A device for installing a piezometer at a predetermined elevation within a borehole, said device being interconnectable with a string of grout pipe, which comprises:

a tubular support pipe, said support pipe being operative to combine with the grout pipe string to form an inner fluid passageway;

a tray, carried by said support pipe, said tray carrying a piezometer embedded in a layer of permeable material, said layer being outermost and operative to make an hydraulic connection between the piezometer and borehole wall;

spring means, associated with the tray, adapted to normally expand to move the tray outwardly and radially to bring the layer of permeable material into contact with the borehole wall;

means for restraining said tray against the support pipe so as to permit the device to be inserted into the borehole; and

means, operable from the ground surface, for releasing the restraining means whereby the spring means may expand to bring the layer of permeable material into hydraulic connection with the borehole wall.

5,062,483

TREATMENT FOR REDUCING WATER CONING IN AN OIL RESERVOIR

Kenneth E. Kisman, and Boyd Russell, both of Calgary, Canada, assignors to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Filed Jun. 15, 1990, Ser. No. 538,313
Claims priority, application United Kingdom, Jun. 15, 1989, 8913834
Int. Cl.[5] E21B *43/12, 43/16*
U.S. Cl. 166—263 **2 Claims**

1. A method for treating a first oil well completed in an oil reservoir, said reservoir having an increased gas saturation in the vicinity of the first oil well, due to gas having been injected into the reservoir through a second adjacent well, said first oil well having a high water cut, said method comprising:

injecting into the reservoir through the first oil well a slug of non-condensible gas in an amount between about 50,000 m^3 and 200,000 m^3; and

placing the first oil well back on production;

whereby the water cut is reduced.

5,062,484

METHOD OF GRAVEL PACKING A SUBTERRANEAN WELL

Donald E. Schroeder, Jr., Littleton, and David O. Falk, Denver, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Aug. 24, 1990, Ser. No. 572,925
Int. Cl.[5] E21B *43/04, 43/08*
U.S. Cl. 166—278 **25 Claims**

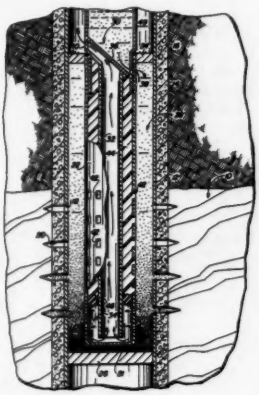
1. A method of gravel packing a well bore penetrating a subterranean formation comprising:

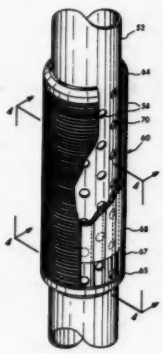
blocking a first group of apertures in a liner with an immobile gel;

positioning said liner within the well bore thereby defining a first annulus between said liner and the well bore;

transporting a slurry comprised of gravel suspended in a fluid into said first annulus, said fluid flowing through a second group of apertures in said liner while said gravel is

deposited within said first annulus to form a gravel pack; and thereafter





removing substantially all of said gel from said first group of apertures.

5,062,485

VARIABLE TIME DELAY FIRING HEAD

David S. Wesson, Waxahachie, and Kevin R. George, Columbus, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 9, 1989, Ser. No. 321,471
Int. Cl.[5] E21B *43/1185*
U.S. Cl. 166—297 **14 Claims**

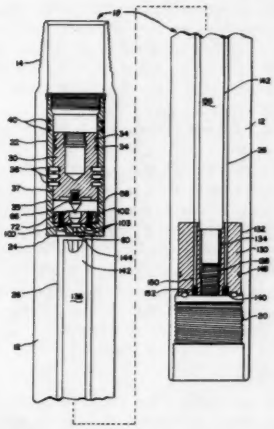
7. In a borehole, a method of perforating a wall of the borehole at a desired location and at a desired perforating pressure condition within the borehole adjacent the desired location, comprising:

positioning a perforating means adjacent the desired location;

a first time delayed combustive reaction;

a second time delayed combustive reaction in response to the first time delayed combustive reaction which, in turn, causes the performation of the wall of the borehole by the actuation of the perforating means; and thereafter,

reducing the pressure within the borehole adjacent the desired location from the initiating pressure condition to the



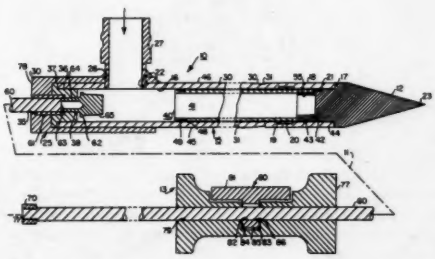
desired perforating pressure condition prior to the perforation of the wall of the borehole.

5,062,486

FIREFIGHTER'S BARRIER PENETRATOR AND AGENT INJECTOR

Charles H. McClenahan, 98 Hurlburt Rd., Fort Walton Beach, Fla. 32548

Filed Dec. 7, 1989, Ser. No. 447,497
Int. Cl.[5] A62C *13/62*
U.S. Cl. 169—70 **7 Claims**



1. A penetrator for percussively penetrating a structure for extinguishing a fire in said structure, said penetrator having an impact end and a striker end, comprising:

an impact barrel having a central axis, an axially-extending internal guide wall, a striker end and an impact end;

an axially extending nozzle barrel slidably disposed in said impact barrel, and having an axially-extending passage, said nozzle barrel having a peripheral wall with nozzle ports therethrough;

a point attached to said nozzle barrel, projecting beyond said impact barrel;

a shoulder on said point laterally aligned with said impact end of said impact barrel for transmission of impact forces from said impact barrel to said point;

an end cap on said impact barrel at its striker end closing said impact barrel, and having an axially extending rod passage therethrough;

a slide rod slidably fitted in said end cap, and a collar on said rod outside of said impact barrel;

a slide hammer reciprocably slidably fitted on said slide rod

having a striker face disposed and arranged so as to be impacted on the striker end of the impact barrel;

retention means on said barrels preventing the nozzle barrel from being expelled from the impact barrel;

rod retention means adapted to retain said slide rod in a first axial position closer to said impact end, and a second axial position closer to said striker end, in said first position much of the striker rod is housed in said barrels to reduce the total axial length of the penetrator, and in said second position much of the slide rod is outside of the barrels to provide a guidance of substantial length for said slide hammer; and

inlet port means through said impact barrel for admitting fluid under pressure into the barrels;

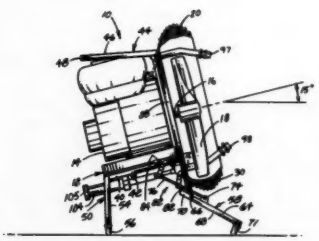
whereby impact of the slide hammer on the impact barrel exerts forces on the structure through the point to penetrate the structure, and whereby after penetration of the structure by the point, fluid under pressure will be admitted to the barrels, thereby extending the nozzle barrel, and exposing the nozzle ports inside the structure in order to inject fluid agent into the structure.

5,062,487

HAND-PORTABLE FIRE FIGHTING POSITIVE PRESSURE WATER MISTING AND VENTILATION BLOWER

Darrell L. Siria, N. 12023 Hemlock Ct., Spokane, Wash. 99218; Lorran Sommerfeld, Spokane, and Daniel G. Raczykowski, Airway, both of Wash., assignors to Darrel Lee Siria, Spokane, Wash.

Filed Jun. 7, 1990, Ser. No. 535,376
Int. Cl.[5] A62C *39/00*
U.S. Cl. 169—91 **25 Claims**



1. A hand-portable fire fighting, positive pressure ventilation and water misting blower for generating and directing a focused water ladened airstream for use in fighting fires and smoke in a structure, using positive pressure ventilation techniques, comprising:

a portable support frame;

an engine mounted on the frame for rotating a propeller drive shaft on a propeller shaft axis in a prescribed direction of rotation;

a propeller having blades, operatively connected to the propeller drive shaft for directing air in an airstream along the propeller shaft axis in a forward direction in the general form of a helix such that the airstream has a forward directional component and a rotational direction about the propeller axis;

a propeller guard mounted on the frame surrounding the propeller;

at least one misting nozzle operatively stationarily mounted to the frame radially outward of the propeller and directed forward and radially inward toward the propeller axis for directing a misted spray of water angularly forward and radially inward into the airstream to cool the airstream and enable the airstream to carry the water mist into the structure; and

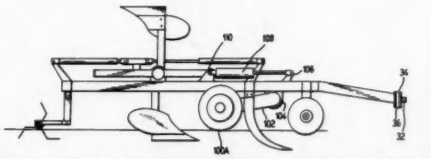
a supply conduit mounted to the misting nozzle and including a water supply fitting for connecting the misting nozzle to a source of water.

5,062,488

SMALL TERRACE GENERATING MACHINE WITH LATERAL DAMMERS

Alan W. Lochmiller, 509 N. Jackson St., Bushnell, Ill. 61422

Filed Jul. 19, 1990, Ser. No. 555,926
Int. Cl.[5] A01B *3/28, 13/02, 13/16*
U.S. Cl. 172—1 **3 Claims**



1. The method of tilling soil to form small, parallel, flat topped terraces with lateral dams, comprising:

a. slicing crop residue and soil with a plurality of coulter means in parallel, widely spaced slices as preparation for tilling soil;

b. tilling parallel, widely spaced strips of soil with a plurality of narrow trench generating means and in line with selected slices as formed in Step a. and leaving a narrow open trench in the soil behind each said narrow trench generating means;

c. tilling parallel, widely spaced, wide furrow strips in the soil with a plurality of furrow generating means so as to form ribbons of soil cut out from said furrow strips, which ribbons are deposited upside down on said narrow open trenches left in the soil by Step b., thereby generating small, parallel, flat topped terraces; and

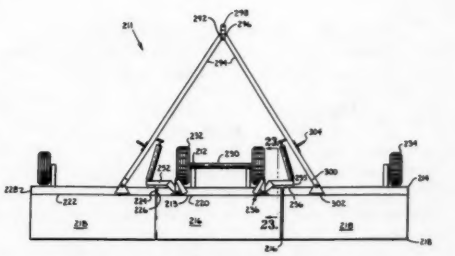
d. collecting loose soil from the wide furrow strips with a lateral dammer means, and depositing loose soil periodically so as to form substantially uniformly spaced barriers or lateral dams between said adjacent small, parallel terraces.

5,062,489

FOLDING AGRICULTURAL IMPLEMENT

Raymond A. Adee, 1504 Terrace Dr., Newton, Kans. 67114

Continuation-in-part of Ser. No. 395,280, Aug. 16, 1989, Pat. No. 4,945,997. This application Aug. 7, 1943, Ser. No. 564,443
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] A01B *73/06*
U.S. Cl. 172—311 **20 Claims**



11. A floating agricultural implement adapted to be connected in a towed relation to a tow vehicle, said implement comprising:

(a) a center implement frame with opposite ends;

(b) a pair of folding, outer implement frames each having a proximate end and a distal end and each being rotatably

and pivotally connected to said rear carrier at said proximate end;

(c) said center and outer implement frames mounting work performing means;

(d) said outer implement frames having field and transport positions;

(e) said outer implement frames being oriented substantially perpendicular to the direction of travel in their field positions and substantially parallel to the direction of travel in their transport positions;

(f) a pair of hinge assemblies each pivotally and rotatably connecting a respective outer implement frame at its proximate end to said center implement frame at a respective end thereof;

(g) towing tongue means adapted for connecting said outer implement frames with a tow vehicle; and

(h) said hinge assembly including means for rotating a respective outer implement frame inwardly about its longitudinal axis as said outer implement frame is folded from its field position to its transport position whereby each said outer implement frame is at least partly retained in its transport position whereby each said outer implement frame is at least partly retained in its transport position by gravity, said rotating means including a first, fixed pivotal connection of said outer implement frame and said center implement frame and a second floating pivotal connection of said outer implement frame, said second pivotal connection being restrained with the implement in its transport position.

5,062,490

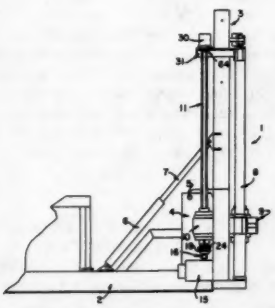
KELLY BAR COUPLING

Charles L. Rassieur, St. Louis County, Mo., assignor to Central Mine Equipment, St. Louis, Mo.

Filed Dec. 22, 1989, Ser. No. 455,948

Int. Cl.[5] E21B *3/04*

U.S. Cl. 173—104 **6 Claims**



1. In an earth drill rig having a right angle drive with a drive stud projecting vertically upwardly from it, a table drive Kelly bar, connected to drive a rotary table mounted to move axially along said table drive Kelly bar, and coupling means associated with said table drive Kelly bar for selectively connecting said drive stud to a lower end of said table drive Kelly bar, and a mast carrying said table drive Kelly bar and adapted to be rotated about a pivot axis offset from the long axis of said table drive Kelly bar from an erected position to a folded position, whereby said lower end of said table drive Kelly bar is arcuately translated away from said drive stud, and to be rotated from said folded position to said erected position, whereby said lower end of said table drive Kelly bar is arcuately translated toward said drive stud, the improvement comprising means for mounting said coupling means on said table drive Kelly bar for axial sliding movement from a coupling position extending below the lower end of said table drive Kelly bar to a non-coupling position and means for limiting the downward sliding of said coupling means and holding said coupling means against sliding off the said table drive Kelly bar, means for moving said table drive Kelly bar axially in a direction toward said drive stud to permit said coupling means to receive and engage said drive stud and table drive Kelly bar, to transmit rotary motion from said drive stud to said table drive Kelly bar, and means for moving said table drive Kelly bar axially in a direction away from said drive stud to pull said coupling means away from said drive stud to de-couple said table drive Kelly from said drive stud.

5,062,491

APPARATUS FOR CONTROLLING NUT RUNNER

Akira Takeshima; Toshikazu Asakura; Akihiko Takahashi; Shigeo Kobayashi, and Shoichi Hayashi, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 288,248, Dec. 22, 1988, Pat. No. 4,908,926.

This application Dec. 29, 1989, Ser. No. 459,332

Int. Cl.[5] B23Q *5/00*

U.S. Cl. 173—12 **5 Claims**

1. An apparatus for controlling a nut runner for tightening a fastener, comprising:

a motor operatively connected to an output shaft of the nut runner for rotating said output shaft;

speed reducer means for reducing a rotational speed of said output shaft, said speed reducer means comprising a switching clutch shiftable selectively in higher and lower speed positions for rotating said output shaft in respective higher and lower speed ranges;

torque sensor means for detecting a tightening torque of said output shaft;

means for presetting torque and speed values corresponding to a switching torque, a snug torque, a final torque, a higher motor speed, a medium motor speed, and a lower motor speed;

comparator means for comparing the detected tightening torque of said output shaft with each of said preset torque values corresponding to said switching, snug and final torques, said comparator means outputting a signal when said detected tightening torque reaches each of said preset torque values;

switching means responsive to the signal output from said comparator means, said switching means outputting a switching signal for switching a rotational speed and torque of said output shaft;

motor driver means responsive to switching signal for controlling said motor and said output shaft through said speed reducer, thereby rotating said output shaft at said higher, medium and lower motor speeds, respectively;

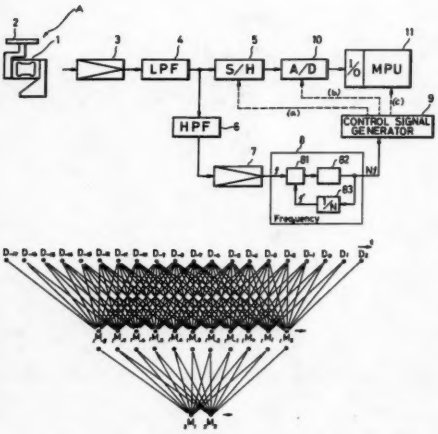
wherein when the switching clutch is shifted into said higher speed position said output shaft is rotated with a lower torque at said higher speed; when the detected tightening torque reaches the preset switching torque the rotation of said output shaft is interrupted, the switching clutch is shifted into said lower speed position and thereafter said output shaft is rotated with a medium torque at said medium speed; when the detected tightening torque reaches said preset snug torque the rotation of said output shaft is interrupted and thereafter said output shaft is rotated with a higher torque at said lower speed; and when the detected tightening torque reaches said preset final torque the rotation of said output shaft is stopped.

5,062,492

ELECTRONIC WEIGHING SCALE

Shinichi Inoue, Tarumiki, Japan, assignor to Yamato Scale Company, Limited, Akashi, Japan

Filed Feb. 16, 1990, Ser. No. 480,843
Claims priority, application Japan, Feb. 18, 1989, 1-38727
Int. Cl.[5] G01G *19/40, 23/10*
U.S. Cl. 177—25.14 **28 Claims**



1. An electronic weighing scale which is adapted to determine the weight of an object, the electronic weighing scale comprising:

means for generating a weight signal having a direct current component indicative of the weight of the object and a superposed periodic oscillatory component having a period T_1 which is an arithmetic function of the weight of the object;

means for determining the period T_1 of the periodic oscillatory component of the weight signal;

means for sampling the weight signal at sampling intervals T_2, having a relationship to period T_1 defined by:

$$nT_1 = NT_2; \text{ and}$$

$$N \geqq 2n$$

where n and N are positive integers, n being the number of cycles of the periodic oscillatory component during which the sampling takes place, and N being the number of samples taken;

means for averaging the samples of the weight signal; and

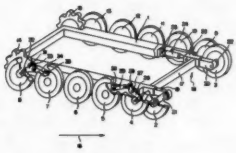
means for determining the weight of the object based on the averaged samples.

5,062,493

TRACKED VEHICLE AND IN PARTICULAR ONE FOR THE PREPARATION OF SKI SLOPES

Helmuth Platter, Vipiteno, and Artur Webhofer, Chiusa, both of Italy, assignors to Leitner, S.p.A., Italy

Filed Jul. 19, 1990, Ser. No. 555,050
Int. Cl.[5] B62D *55/30*
U.S. Cl. 180—9.52 **6 Claims**



1. A tracked vehicle supported at each side thereof on an endless track for travel across a terrain, and suited in particular for the preparation of ski slopes, said vehicle comprising a self-bearing chassis having spaced, longitudinal sides, a plurality of track bearing wheels fixed to rotate in a vertical plane on longitudinally spaced horizontal axles at each longitudinal side of the chassis, a track drive wheel fixed in a rotating manner on a horizontal axle adjacent a first end of each longitudinal side of the chassis, a track tightening wheel fixed to a horizontal axle adjacent a second end opposite said first end of each longitudinal side of the chassis characterized in that at least one of said bearing wheels on each longitudinal side of said chassis is supported by said chassis in a manner to be movable in the vertical plane containing each said at least one bearing wheel, and drive means provided for moving each of said at least one bearing wheel from a lowered position, in which a lower leg of said track supported thereon is in contact with the underlying terrain during the travel of the vehicle across said terrain, to a raised position above said lowered position, said plurality of bearing wheels at each side of said chassis lying in a vertical plane spaced parallel to a plane containing the associated track tightening wheel, a first and second of each of said plurality of bearing wheels at each side of said chassis being disposed in overlapping, registering relation to a respective track drive and tightening wheel at each end of said chassis.

5,062,494

HYDRAULIC POWER STEERING APPARATUS FOR INDUSTRIAL VEHICLE

Tsukasa Okamoto, and Shuji Ohta, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Aug. 20, 1990, Ser. No. 569,936
Claims priority, application Japan, Aug. 22, 1989, 1-215407
Int. Cl.[5] B62D *5/06*
U.S. Cl. 180—132 **8 Claims**

1. A fully hydraulic power steering apparatus for hydraulically steering an industrial vehicle by pivoting rear wheels of the vehicle, comprising:

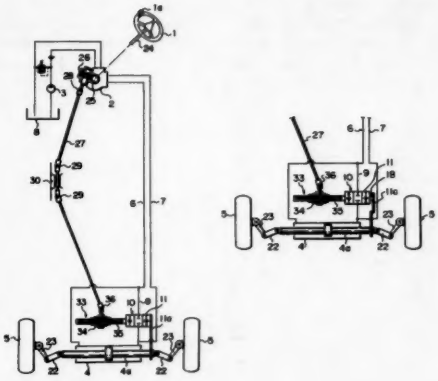
a steering wheel turned by a driver of the vehicle;

a power steering hydraulic valve unit operated by the steering wheel for delivering pressurized oil;

a double-rod type power cylinder including a pair of oil chambers for receiving the pressurized oil when delivered from the power steering hydraulic valve unit, and a piston rod capable of hydraulically carrying out a stroke motion for actuating a pivoting of the rear wheels in response to a turning of the steering wheel;

oil piping interconnecting the power steering hydraulic valve unit and the pair of oil chambers of the power cylinder, respectively; and

a correcting means for compensating an error between an angle by which the steering wheel is turned and an amount of stroke motion of the piston rod of the power cylinder, said correcting means including a first mechanical means operatively and mechanically connected to said steering wheel for deriving a first mechanical motion from the turning of said steering wheel, a second mechanical



means operatively and mechanically connected to said power cylinder for deriving a second mechanical motion from the stroke motion of the piston rod of said power cylinder, and a hydraulic correcting means for generating a hydraulic correction force in proportion to an error in the first and second mechanical motions which hydraulically corrects the stroke motion of the piston rod of the power cylinder.

5,062,495

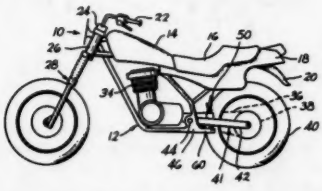
REAR SUSPENSION SYSTEM FOR MOTORCYCLES

Ray T. Padgett, Rte. #1, Box 1253 C, Dawsonville, Ga. 30354

Filed Jun. 18, 1990, Ser. No. 539,550

Int. Cl.[5] B62D *61/02*

U.S. Cl. 180—227 **13 Claims**



1. In a suspension system for a motorcycle which has a steerable front wheel and a driven rear wheel:

a motorcycle frame having the steerable front wheel mounted thereon,

a movable swingframe supporting said rear wheel for movement on said frame,

a shock absorber comprising an outer casing thereof mounted on mounting points on said motorcycle frame and said swingframe for movement therewith,

said shock absorber including means for cushioning and resisting said shock absorber casing, and

said shock absorber being arranged so that when the rear wheel is moved downwardly, the mounting points are moved closer together.

5,062,496

STRUCTURE FOR MOUNTING AIR CLEANER OF ENGINE

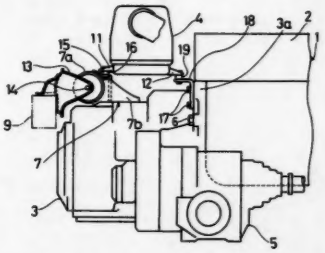
Hirotaka Fukada; Koichi Kondoh, both of Hiroshima, and Tsuyoshi Tsuchida, Yamaguchi, all of Japan, assignors to Mazda Motor Corporation, Japan

Filed Jul. 25, 1989, Ser. No. 385,346

Claims priority, application Japan, Jul. 29, 1988, 63-101202

Int. Cl.[5] B60K *5/12*

U.S. Cl. 180—291 **15 Claims**



1. An assembly for mounting an air cleaner to an automobile power plant having an engine and a transmission, comprising:

first, means mounting said air cleaner to a portion of said power plant which is substantially vibrated by said engine;

second means mounting said air cleaner to a portion of said power plant which is substantially vibrated by said transmission; and

frame member mounting means for connecting said second mounting means to an associated vehicle body, said frame member mounting means including

first bracket means for connecting said frame member mounting means to said second mounting means,

second bracket means for connecting said frame member means to said vehicle body, and

means for connecting said first bracket means to said second bracket means, whereby vibration of said air cleaner at a natural frequency thereof by said power plant is prevented.

5,062,497

SYSTEM FOR CONTROLLING SPRING COEFFICIENT OF ENGINE MOUNT

Hisashi Ogata, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 3, 1989, Ser. No. 374,668

Claims priority, application Japan, Jul. 1, 1988, 63-87748[U]

Int. Cl.[5] F16M *13/00*

U.S. Cl. 180—300 **3 Claims**

1. An engine mount system for an automotive power plant for mounting a vehicle body, comprising:

a fluid filled insulator defining therein at least two fluid chambers mutually separated from each other, and a fluid passage connected to said fluid chambers for fluid communication therebetween;

valve means disposed within said fluid passage for selectively establishing and blocking fluid communication therethrough, said valve means including electrically

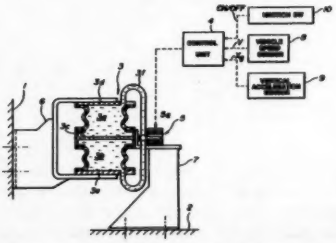
operable means for operating said valve means between open and closed positions;

first sensor means for monitoring a vehicle speed for producing a vehicle speed indicative signal;

second sensor means, associated with a vehicular suspension member rotatably supporting a road wheel, for monitoring a vertical displacement between the vehicle body and the suspension member to produce a vertical acceleration indicative signal of said suspension member, in such a manner as to detect a road surface condition;

a control unit for receiving said vehicle speed indicative signal and said vertical acceleration indicative signal and discriminating between a first state of a vehicle driving condition, wherein a vehicle travels at a constant speed, a second state of the vehicle driving condition, wherein the vehicle is accelerating or decelerating, and a third state of the vehicle driving condition, wherein the vehicle is stopping or substantially stopping, said control unit operating said valve means at said open position during said third state, and at said closed position during said second state, said control unit further discriminating said road surface condition on the basis of said vertical acceleration indicative signal from said second sensor means;

wherein said control unit selects one of two road surface



dependent vibration modes of said insulator, one being a road surface dependent first vibration mode having a resonating point at a first specific resonant frequency with respect to an operational mode of said insulator in a state wherein said valve means is in said open position, the other being a road surface dependent second vibration mode having a resonating point at a second specific resonant frequency with respect to the operational mode of said insulator in a state wherein said valve means is in said closed position, on the basis of said road surface condition; and

wherein said control unit selects one of said first and second vibration modes having a resonating point far from the resonating points of the vehicle body derived on the basis of a value of said vehicle speed indicative signal and a known wheel base of the vehicle when said control unit determines that said driving condition is in said first state and said road surface condition is an irregular undulation road surface, and selects one of said first and second vibration modes having a resonating point far from the resonating points of the vehicle body derived on the basis of an interval of undulation when said control unit determines that said driving condition is in said first state and said road surface condition is a regular undulation road surface.

5,062,498

HYDROSTATIC POWER TRANSFER SYSTEM WITH ISOLATING ACCUMULATOR

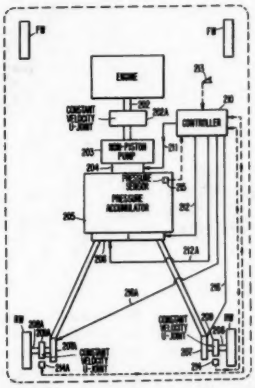
Jaromir Tobias, 322 E. 57th St., New York, N.Y. 10022

Filed Jul. 18, 1989, Ser. No. 381,197
Int. Cl.[5] B60K *17/356*; F15B *1/02*
U.S. Cl. 180—308 **22 Claims**

1. A hydrostatic power transfer system for transferring power from a rotating power input shaft to a rotating output shaft, comprising:

fluid pump means driven by a power input shaft and including means for supplying pressurized fluid to a pump outlet means,

pressure accumulator means disposed downstream of the pump means and having respective accumulator inlet means for accepting pressurized fluid from the pump outlet means and accumulator outlet means for discharging fluid under pressure from the accumulator means, said accumulator means including two chambers and pressure transmissive means separating said two chambers, the pressurized fluid from said fluid pump means being sup-



plied to one of the two chambers and the other chamber including spring cushion means for acting against said pressurized fluid in said one chamber via said pressure transmissive means for insulating the system against vibration transmission through the accumulator means and

fluid motor means downstream of the pressure accumulator means and driven by fluid from the accumulator outlet means whereby said pressure accumulator means is interposed in series between said fluid pump means and the fluid motor means so that it substantially eliminates transmission of vibrations from the fluid pump means to the fluid motor means, said fluid motor means being drivingly connectable to a rotating output shaft.

5,062,499

SIDE RAILS FASTENING MECHANISM FOR TELESCOPIC ALUMINUM STEP LADDERS

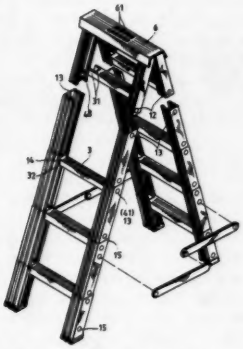
Ching-Chuan Tu, No. 24, Feng-Shu Lane, Feng-Shu Li, Nan-Tun District, Taichung, Taiwan

Filed Oct. 10, 1990, Ser. No. 596,706
Int. Cl.[5] E06C *1/30, 7/50*
U.S. Cl. 182—166 **6 Claims**

1. A side rails fastening mechanism for securing the frame fractions of the side rails of a telescopic aluminum step ladders in an extended or collapsed position, comprising an insert block fixedly secured inside each frame fraction at a lower position with a locking bolt fastened inside a transverse hole thereon and pushed by a compression spring to insert through a mounting hole on the frame fraction disposed at an inner side into a locating hole on the frame fraction disposed at an outer side so as to firmly secure two connected frame fraction in an extended position; and characterized in that:

said insert block has two parallel grooves on the top and spaced from each other at such a range that a rung can be secured thereto with its two opposite side projections respectively inserted in the two parallel grooves, and

fastening screws can be inserted from the two opposite sides of each frame fraction to fixedly secure a rung and



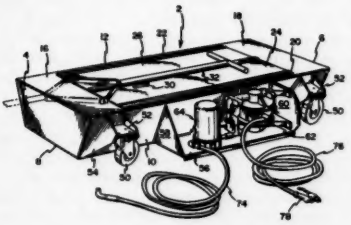
said insert block to a frame fraction permitting a frame fraction to freely slide inside another.

5,062,500

LOW PROFILE CART FOR THE INSITU COLLECTION FILTERATION AND RECYCLE OF FLUIDS FROM MACHINERY

Robert E. Miller, Mount Joy, and F. Jay Eichelberger, Jr., Paradise, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Nov. 28, 1990, Ser. No. 619,286
Int. Cl.[5] F16N *31/00*
U.S. Cl. 184—106 **24 Claims**



1. A low profile cart for the collection, filteration and recycle of fluid from machinery comprising:

a) a movable fluid receiving chamber having front, rear, bottom, left and right side panels forming a top opening;

b) means connected to said cart for manually positioning said cart;

c) drain means associated with said chamber and extending from said rear panel;

d) side support means outside of said chamber and connected to one of said left and right side panels;

e) said side support means having means for positioning pump and filter means;

f) means for connecting said pump and filter means to said drain means;

g) said chamber sloping from said front to said rear for permitting fluid in said chamber to be substantially and completely removed after collection from said chamber;

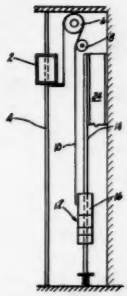
h) whereby when said cart is connected to said pump and filter means and said pump is activated, said fluid collected in said chamber will be evacuated therefrom and run through said filter for eventual reuse.

5,062,501

ELEVATOR WITH LINEAR MOTOR COUNTERWEIGHT ASSEMBLY

Marcel Pavoz, Nanterre, France, and Ernest P. Gagnon, Manchester, Conn., assignors to Otis Elevator Company, N.J.

Continuation of Ser. No. 318,293, Mar. 3, 1989, abandoned. This application May 4, 1990, Ser. No. 518,275
Int. Cl.[5] B66B *1/06*
U.S. Cl. 187—112 **8 Claims**



1. An elevator assemblage of the type which derives motive power for movement through a hoistway from a linear motor mounted on an elevator counterweight assembly, said elevator assemblage comprising:

a) a counterweight frame;

b) a flat linear motor mounted on said counterweight frame, said linear motor being mounted centrally on said frame whereby said frame includes side portions which in part flank said linear motor;

c) a flat steel strip disposed adjacent said counterweight frame, said steel strip being elongated in the vertical direction of the hoistway, said steel strip including a central portion facing said linear motor, which central portion is coated with a highly electrically conductive material coating whereby said coated central portion of said steel strip serves as a stator for said linear motor and said steel strip having side margins flanking said central portion which are uncoated exposed steel; and

d) brake means mounted on said counterweight frame for engaging only said exposed steel side margins of said steel strip to selectively stop movement of said counterweight assembly in the hoistway.

5,062,502

ELEVATOR CONTROLLING APPARATUS

Masaaki Amano, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 19, 1990, Ser. No. 511,403
Claims priority, application Japan, May 18, 1989, 1-22788
Int. Cl.[5] B66B *1/18*
U.S. Cl. 187—124 **6 Claims**

1. An elevator controlling apparatus comprising:

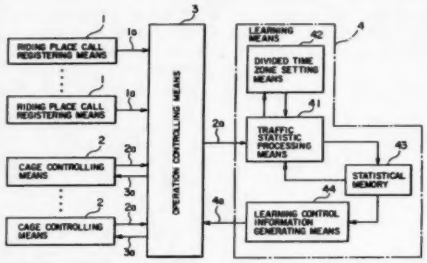
a plurality of hall call registering means for generating information with respect to hall calls;

a plurality of cage controlling means which are provided in correspondence with a plurality of elevator cages, which generate information with respect to cage calls and cage traffic information in each of the elevator cages and which control the operation of said elevator cages;

learning means which calculates traffic values in unit time zones on the basis of cage traffic information so that when the traffic in a unit time zone is similar to that of an adjacent unit time zone, these time zones are combined into a divided time zone, and when a divided time zone exceeds a predetermined time, a new divided time zone is set; and

operation controlling means for controlling said plurality of

cage controlling means on the basis of the traffic values for unit time zones, the divided time zones, said information with respect to cage calls and said information with respect to hall calls.



5,062,503

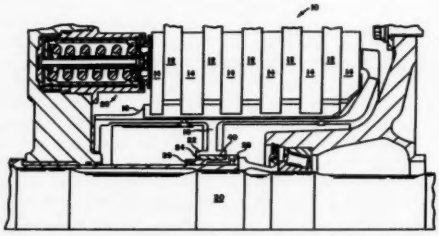
ABLATIVE BRAKE BUSHING FOR AXLE THERMAL PROTECTION

Raymond J. Black, and Benjamin C. Han, both of South Bend, Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 19, 1990, Ser. No. 585,415

Int. Cl.[5] F16D *55/36*

U.S. Cl. 188—71.5 **26 Claims**



1. In combination, an ablative bushing utilized with a brake mechanism in order to protect thermally an axle, comprising a brake mechanism receiving support from a support member, the support member having a central aperture through which extends an axle,. one of bushing means and flange means disposed between said axle and support member, and an ablative bushing disposed between the support member and one of the bushing means and flange means, the ablative bushing ablatable at a predetermined temperature in order to introduce an air gap between said support member and one of the bushing means and flange means in order to reduce heat flow from said brake mechanism to said axle.

5,062,504

DRUM BRAKE ASSEMBLY HAVING PARKING BRAKE ACTUATOR ADJUSTER WITH AUTOMATIC BRAKE ADJUSTMENT DURING THE SERVICE BRAKING MODE OF OPERATION

Mayjue A. Yamamoto, Yellow Spring, Ohio, assignor to General Motors Corporation, Detroit, Mich.

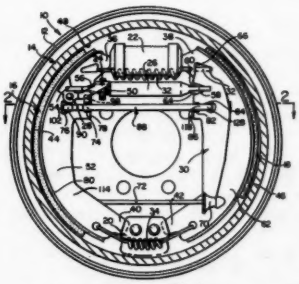
Continuation of Ser. No. 351,974, May 5, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 651,057

Int. Cl.[5] F16D *51/46, 65/24*

U.S. Cl. 188—79.56 **1 Claim**

1. In a drum brake assembly having a rotatable drum to be braked; first and second brake shoe assemblies adapted to be moved into friction braking engagement with the drum in a service brake operating mode and in a parking brake operating mode said first brake shoe assembly having a web portion with an aperture; first actuating means for moving said shoe assemblies in the service brake operating mode; second actuating means for moving said shoe assemblies in the parking brake operating mode and including a parking brake actuating lever having one end pivotally mounted on said second brake shoe assembly, a parking brake cable attached to the other end of the parking brake actuating lever and adapted to pivotally move that lever toward the first brake shoe assembly for parking brake actuation; and an automatic adjuster actuated as needed in the service brake operating mode and including an axially expandable adjuster strut operatively connecting said first and second shoe assemblies and said parking brake actuating lever; the improvement comprising:

a parking brake spreader bar also providing a parking brake actuating lever adjuster, said spreader bar having one end with a tab for a hooked connection with said web aperture of said first shoe assembly and the other end of said spreader bar having a tab for a hooked connection to said parking brake actuating lever and said spreader bar being in force transmitting engagement with said first shoe assembly and said parking brake actuating lever to transmit both tension and compression forces therebetween; said spreader bar during the service brake actuation phase



acting, as the brake shoe assemblies are spread apart in the vicinity of said spreader bar by said first actuating means, to move with said first brake shoe assembly and by exerting tension force on said parking brake actuating lever pivotally moving that lever toward the parking brake apply position to take up such lever movement as would be required in the parking brake apply phase to move the brake shoe assemblies substantially to the position to which they are moved by said first actuating means; said spreader bar acting to keep said parking brake actuating lever at an adjusted pivotal position on said second brake shoe assembly attained when the service brake mode automatic adjuster has expanded the adjuster strut to provide a brake shoe assembly brake release position that is a position adjusted for wear of said brake shoe assemblies by said spreader bar positional translation in a direction toward said first brake shoe assembly resultant of said first brake shoe assembly web aperture hooked connection with said spreader bar causing said spreader bar to pull on said parking brake lever; said parking brake actuating lever, thus being positionally adjusted to compensate for brake lining wear.

5,062,505

BRAKE BLOCK HOLDER ARRANGEMENT

Anders O. G. Sjärne, Rättarev, and Sven-Olof Larsson, Bästemansg, both of Sweden, assignors to SAB Nordic AB, Landskrona, Sweden

Filed Apr. 19, 1990, Ser. No. 511,338

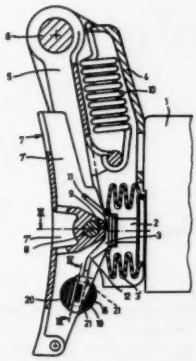
Claims priority, application Sweden, Apr. 27, 1989, 8901537-4

Int. Cl.[5] B60T *11/10*; B61H *1/00*

U.S. Cl. 188—153 R **1 Claim**

1. A brake block holder arrangement, comprising a brake block holder (7) for transmitting an axial brake force from an

axially movable push rod (2) of a brake actuator (1) and being pivotally attached to brake block hangers (5), which are suspended from a suspension bracket (4) on the actuator, wherein the brake force is transmitted from the push rod (2) via a push rod head (3) thereon in direct contact with a generally tube-shaped portion of the brake block holder (7) around its shaft (8) for pivotal connection to the hangers, characterized in that the



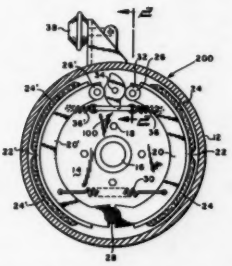
push rod head (3) has an upper extension (11) and a lower extension (12) with a width corresponding to the distance between the side-walls (7') of the brake block holder (7) and that one of the extensions (12) of the push rod head (3) is provided with a laterally movable cross piece (19) having toothed end surfaces for cooperation with spring biassed toothed segments (16), rotatably arranged in the inner surfaces of said brake block holder sidewalls (7').

5,062,506

ROTARY DRUM BRAKE ASSEMBLY BRACKET

Jay D. White, Galesburg, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 8, 1990, Ser. No. 564,274
Int. Cl.[5] F16D *51/20*
U.S. Cl. 188—329 10 Claims



1. An anchor bracket for a brake assembly, which brakes a rotary drum, said brake assembly of the type comprising:

a stationary backing plate,

a pair of opposed brake shoes assemblies respectively having opposite ends with one end pivotally secured to the stationary plate and carrying a frictional braking material facing towards the drum,

a cam disposed between the opposite ends of the brake shoe assemblies and mounted on a rotary shaft and operative to rotate and urge the brake shoe assemblies away from each other and cause the frictional braking material to engage the drum upon actuation of the brake, and

biasing means respectively having one end secured to each brake shoe assembly and an opposite end secured to the bracket, said bracket having an inverted "U" type configuration comprising a pair of legs extending from opposite sides of a bridging portion,

said legs respectively secured in substantial transverse relationship to the backing plate, said bridging portion having a height above the cam, and said legs spaced apart from each other for a distance sufficient to enable the bracket to be disposed in close proximity to the cam, and

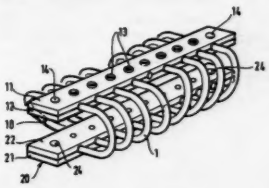
said legs respectively provided with means for securing the opposite ends of the biasing means thereto in such a manner as to enable the biasing means to urge the brake shoe assemblies towards each other upon release of the brake.

5,062,507

VIBRATION AND SHOCK ABSORBER DEVICE

André Roche, Elancourt, France, assignor to Vibrachoc, Evry Cedex, France

Filed Aug. 18, 1989, Ser. No. 396,186
Claims priority, application France, Sep. 5, 1988, 88 11584
Int. Cl.[5] F16F *7/00*
U.S. Cl. 188—378 8 Claims



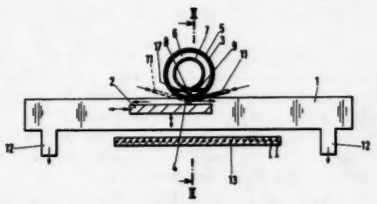
1. In a vibration and shock absorber device, comprising a metal body constituted by at least one helically wound length of cable of plural turns and two bars interconnecting the turns in two diametrically opposite zones, and a layer of elastomer material coating the structure and leaving a central orifice, the improvement comprising said turns of said length of cable comprising means for preventing said turns from adhering to the elastomer material.

5,062,508

CVD COATING PROCESS FOR PRODUCING COATINGS AND APPARATUS FOR CARRYING OUT THE PROCESS

Ulrich Ackermann, Mainz-Gonsenheim; Ralf T. Kersten, Bremthal; Heinz-Werner Etzkorn, Neu-Ansbach; Volker Paquet, and Uwe Rutze, both of Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 403,430, Sep. 6, 1989. This application Dec. 7, 1989, Ser. No. 447,480
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1988, 3830215; Aug. 7, 1989, 3926023
Int. Cl.[5] C23C *16/48*
U.S. Cl. 118—723 16 Claims



1. An apparatus for a chemical vapor deposition process comprising:

a reaction chamber in which a substrate is coated;

a tubular prechamber containing tubular shield means disposed therein;

means for generating electromagnetic radiation in said prechamber, said prechamber having an opening which communicates with the interior of said reaction chamber;

means for supplying reaction gas to said reaction chamber;

vacuum means for reducing the pressure in the reaction chamber and for removing consumed reaction gases; and

means for supplying at least one component of the reaction gas to the reaction chamber adjacent said opening other than from the prechamber.

5,062,509

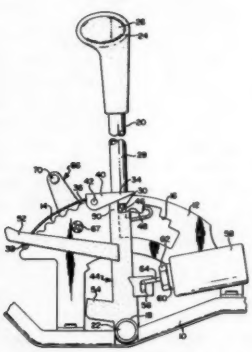
SHIFTER MOUNTED BRAKE-TRANSMISSION INTERLOCK

Vincent N. Carpenter, Elk Rapids, and William J. LaRocca, Sterling Heights, both of Mich., assignors to Dura Mechanical Components, Inc., Troy, Mich.

Filed Jun. 4, 1990, Ser. No. 534,559

Int. Cl.[5] B60K *41/28*

U.S. Cl. 192—4 A **7 Claims**



1. In an automobile having an ignition switch, an automatic transmission, a service brake actuator, and an automatic transmission control lever movable into and out of a park position, a shift lever control comprising:

blocking means movable between positions blocking and enabling movement of the shift lever only out of the park position; and

control means for controlling movement of the blocking means characterized by

an electric acutator for moving the blocking means between positions,

a normally closed electric brake switch opened by movement of the service brake to brake-apply position and closed by movement to the brake-release position,

a normally closed electric shifter switch,

cam means coupling the shift lever to the shifter switch for opening the shifter switch only upon movement of the shift lever out of the park position, and

an electric control circuit interconnecting the ignition switch, the brake switch, the shifter switch and the electric actuator in such a manner that the actuator effects movement of the blocking means to blocking position only when the ignition switch, the brake switch and the shifter switch are closed.

5,062,510

SHIFTING DEVICE FOR LAWN MOWER AND THE LIKE

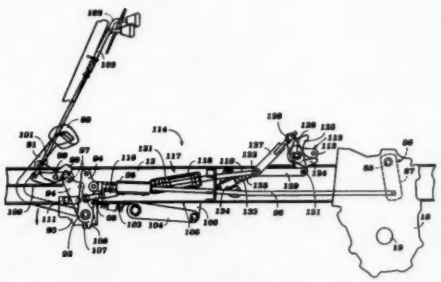
Toshiharu Shimizu, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 2, 1989, Ser. No. 346,476

Claims priority, application Japan, May 6, 1988, 63-110182

Int. Cl.[5] B60K *41/26, 20/00*

U.S. Cl. 192—4 C **9 Claims**



1. In a vehicle having a transmission operative between a neutral condition and a drive condition, transmission operator means selectively operable by an operator for operating said transmission between its neutral and drive conditions, a brake for braking an operation of said vehicle, a brake operator selectively operable by an operator, and means connecting said brake operator to said brake for operating said brake, the improvement comprising means for positively moving said transmission to its neutral condition from a drive condition in response to operation of said brake operator comprising a pair of pivotally connected jaw members acting on a pin member affixed to the mechanism for coupling said transmission operator means to said transmission.

5,062,511

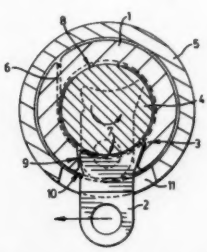
BRAKE ACTUATOR FOR BICYCLES AND THE LIKE

Winnett Boyd, 107 Victoria Place R.R. No. 1, Bobcaygeon, Ontario, Canada K0M 1A0

Filed Jan. 22, 1991, Ser. No. 644,384

Int. Cl.[5] F16D *41/24*

U.S. Cl. 192—5 **3 Claims**



1. In a device for operating a brake of a pedal operated vehicle, comprising a brake operating lever projecting through an opening in a pedal crankshaft housing of the vehicle and having an inner end forming a first primary clutch element engageable with part of the circumference of a pedal crankshaft within the housing, a pilot clutch comprising two oppositely wound spring coils connected by a bight engaged in a yoke, the bight ends of the coils being directed in the direction of forward rotation of the crankshaft, the inner end of the lever having an end extending around the crankshaft circumference in the opposite direction to said yoke, means extending from the said end of the lever and wrapping around the crankshaft so as to form a second primary clutch element engageable with

the circumference of the crankshaft at least in a zone opposite to that engageable by the lever, and means transmitting forces from the yoke to a distal end of said first primary clutch portion whereby to wrap the latter onto the crankshaft upon rearward motion of the crankshaft, the improvement wherein:

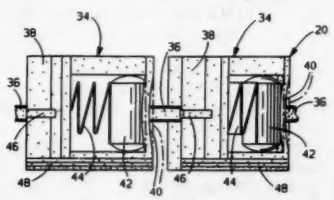
the second primary clutch element is formed by a major peripheral portion of an annulus surrounding the pedal crankshaft within the pedal crankshaft housing, and the first primary clutch element is received within an arcuate slot formed through a remaining peripheral portion of the annulus, bearing surfaces on the annulus at opposite ends of said arcuate slot providing respectively the means transmitting forces from the yoke to the distal end of the primary clutch portion, and a fulcrum for engagement by said inner proximate end of the primary clutch portion, such that the pedal crankshaft can be clamped between the primary clutch element and the secondary clutch element.

5,062,512

ROLLER CLUTCH CAGE WITH PUSH ON INSTALLATION

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1990, Ser. No. 558,007
Int. Cl.[5] F16D *41/00*
U.S. Cl. 192—45 **3 Claims**



1. A roller clutch cage adapted to be installed between a pair of coaxially disposable clutch races, one of said races having a generally cylindrical surface with a circular groove, said cage comprising,

a plurality of adjacent roller pockets arrayed in an annular pattern about and parallel to a central axis, each pocket having a boundary defining member that is flexible, in the circumferential direction, toward and away from each adjacent pocket,

a plurality of connecting members interconnecting said adjacent pockets at said flexible boundary defining members, thereby determining a free state circumference of said cage that is designed to clear said one race surface when said cage is moved coaxially toward said one race, said connecting members further being substantially rigid and disposed generally in a central plane perpendicular to said central axis so that, when said cage is put into compression or tension, said connecting members translate said compression or tension into circumferential flexing of said boundary defining member in said central plane, thereby allowing the circumference of said cage to effectively shrink or expand from its free state circumference while said pockets remain substantially parallel to said cage axis, and,

a plurality of ribs located at evenly spaced, diametrically opposed locations and at a diameter designed to fit within said race groove, but to interfere with said one race surface when said cage is at its free state circumference, thereby applying an evenly distributed radial force to said cage to put said cage into compression or tension,

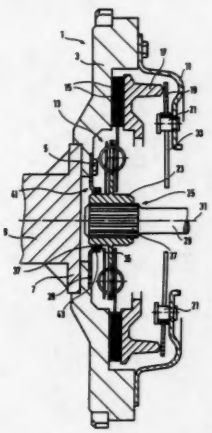
whereby, said cage may be installed to said one race by moving it, at its free state circumference, coaxially toward said one race, thereby forcing said ribs into said one race surface to put said cage into compression or tension and shrinking or expanding said cage circumference as said cage pockets remain substantially parallel to said cage axis until said ribs move into alignment with said groove, whereupon said cage may return to its free state circumference as said ribs move into said groove.

5,062,513

HUB GUIDANCE FOR FRICTION CLUTCH

Wolfgang Grosspietsch, Schweinfurt, and Erich Scheer, Possel-sheim, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Fed. Rep. of Germany

Filed Nov. 3, 1989, Ser. No. 431,739
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1988, 3838306; May 24, 1989, 3916853
Int. Cl.[5] F16D *13/50, 13/58*
U.S. Cl. 192—70.17 **9 Claims**



1. A friction clutch for arrangement in the drive line of a motor vehicle between a crank-shaft (9) which is rotatable about a rotation axis (31) and a gear shaft (29) coaxial with the crank-shaft (9), comprising a fly-wheel (3) securable by means of at least one securing element (5) on the crank-shaft (9), a clutch cover (11) held on the fly-wheel (3), a presser plate (17) arranged between the fly-wheel (3) and the clutch cover (11) and guided non-rotatably but axially movably on the clutch cover (11), a clutch disc (13) which comprises a hub (23) with an internal splining (25) for a non-rotatable but axially movable connection with the gear shaft (29) and friction linings (15) which can be clamped axially between the fly-wheel (3) and the presser plate (17), and a clutch main spring arrangement (19) provided with release elements (33), wherein said fly-wheel (3), securing element (5), clutch cover (11), and presser plate (17) each form a construction part of said friction clutch, the hub (23) of the clutch disc (13) is radially guided and centered by means of a bearing concentric with the rotation axis (31) separate from and independent of the gear shaft (29), on one of the construction parts (3; 5; 11; 17) of the friction clutch (1), and said gear shaft (29) has an end adjacent to and spaced from said crank-shaft (9) and said end is free of pilot bearing guidance, the bearing (41, a, i, k, m) is provided between the hub (23; a, i, k, m) and a bearing carrier (39, i, ki, m; 43*a*) held on the fly-wheel (3, a, i, k, m), the bearing carrier (39; 43*a*; 39*i*) is held on fly-wheel (3, a, i) by means of a plurality of fastening elements provided for the securing of the fly-wheel (e, a, i) on the crank-shaft (9, a, i) on a circle about the rotation axis (3, a, i), the fly-wheel (3*i*) is made as a two-mass fly-wheel and comprises a first fly-wheel (69) which is securable by means of the securing elements (5*i*) on the crank-shaft (9*i*) and a second fly-wheel (75) rotatable about the rotation axis (31*i*) in relation to the first fly-wheel (69), which second fly-wheel is rotation-

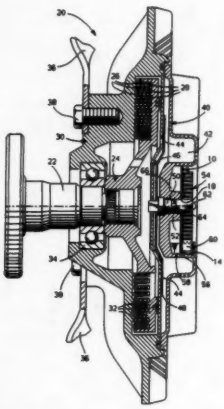
ally elastically coupled with the first fly-wheel (69) through a torsion spring device (79), and wherein the bearing carrier (39*i*) comprises, radially within the circle of arrangement of the securing elements (5*i*), a collar (43*i*) protruding axially to the clutch disc (13*i*), on which collar the hub (23*i*) is mounted and merges radially outside the circle of arrangement into a bearing plate (71) on which the second fly-wheel (75) is guided.

5,062,514

INSULATING RETAINER FOR A VISCOUS FLUID CLUTCH

Lawrence C. Kennedy, Kettering, and Harvey J. Lambert, West Milton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 22, 1991, Ser. No. 688,796
Int. Cl.[5] F16D *35/02*
U.S. Cl. 192—82 T **11 Claims**



1. A viscous fluid clutch comprising:
(a) a housing;
(b) a bimetallic coil mounted on the housing for controlling clutch rotation; and
(c) insulating means mounted between the housing and the bimetallic coil for inhibiting radiant heat transfer from inside the housing to the bimetallic coil.

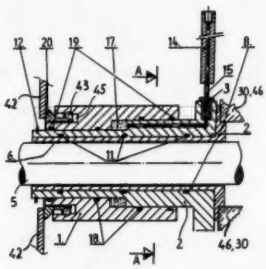
5,062,515

CLUTCH CONTROL DEVICE

Luigi R. Cimarosti, Quai de l'Ourthe, 7, Comblain-au-Pont, Belgium B-4170

PCT No. PCT/BE89/00035, § 371 Date Mar. 8, 1990, § 102(e) Date Mar. 8, 1990, PCT Pub. No. WO90/01123, PCT Pub. Date Feb. 8, 1990
PCT Filed Jul. 20, 1989, Ser. No. 477,832
Claims priority, application Switzerland, Jul. 21, 1988, 02 789/88-9
Int. Cl.[5] F16D *25/00*
U.S. Cl. 192—91 A **8 Claims**

1. In a friction clutch comprising two rotary parts (32,34) capable of being pressed against one another or separated as desired; a tube (8), intended for carrying at one end a conventional clutch bearing, concentrically surrounding a rotary shaft (5) and bearing at its other end against an end bearing (46) of a clutch housing (30), the improved clutch control device comprising: a piston (1), having two different inside diameters, adapted to slide on a cylinder (2) having a central bore (6) and two different outside diameters corresponding to the two inside diameters of piston (1), whereby a chamber (17) of varying volume can be defined between them by sliding piston (1) along cylinder (2); an orifice (3) for forcing fluid under pressure into chamber (17) and an orifice (13) for bleeding fluid therefrom; the assembly comprising cylinder (2) and piston (1) being capable of being slid onto tube (8) so that at one end the cylinder (2) bears against the end bearing (46) of clutch housing (30), while at the other end piston (1) indirectly bears on a moveable part (42) in contact with rotary part (34) through the means of a ring (20) located in a cavity (45) situated at the end of piston (1), said ring (20) constituting the clutch bearing and,



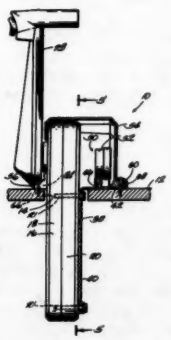
together with the outer wall of the cavity (45) and balls (43), forming a ball-bearing fitting; the introduction of fluid under pressure into chamber (17) causing piston (1) to slide on cylinder (2) in the direction of ring (20) thereby setting in motion ring (20) and, in turn, moveable part (42) which causes the separation of rotary parts (32,34), the reverse action being initiated when the fluid is bled from chamber (17).

5,062,516

SINGLE LEVER CONTROL

Anthony P. Prince, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 201,378, May 27, 1988, abandoned, which is a continuation of Ser. No. 738,183, May 28, 1985, abandoned. This application Mar. 12, 1990, Ser. No. 494,789
Int. Cl.[5] B60K *41/02*
U.S. Cl. 192—0.096 **11 Claims**



1. A single lever control adapted to be mounted on a generally horizontal mounting surface having therein an opening, said control comprising a housing which is adapted to extend through the opening and which includes an upper portion adapted to extend above the mounting surface, and a lower portion adapted to extend below the mounting surface, an operating mechanism including a clutch control member movably mounted on said housing, a throttle control member movably mounted on said housing, and a control level pivotally mounted on said upper portion of said housing and operably connected to said throttle control member and to said clutch control member, a mounting bracket mounted on said housing, said mounting bracket including a vertical portion fixedly connected to said lower portion of said housing and adapted to

extend through the opening, and a horizontal portion adapted to be connected to the mounting surface adjacent the opening, warning means mounted exteriorly of said housing on said mounting bracket and adapted to be operably connected to an engine for providing a warning signal when an engine condition exceeds a predetermined value, said warning means being mounted on said horizontal portion of said mounting bracket, a cover connected to said housing and including means for engaging the mounting surface, said cover partially enclosing said upper portion of said housing and enclosing said warning means, and said cover enclosing said horizontal portion of said mounting bracket and being adapted to be fixedly connected with said horizontal portion of said mounting bracket to the mounting surface, and an ignition switch mounted on said cover and adapted to be operably connected to an engine ignition system.

5,062,517

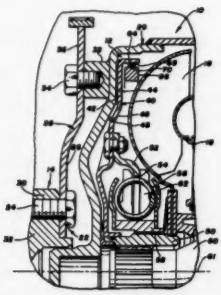
TUNED DAMPER FOR A TORQUE CONVERTER CLUTCH

Robert A. Muchmore, Mason, and William H. Roth, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 9, 1990, Ser. No. 594,901

Int. Cl.[5] F16D *3/14*

U.S. Cl. 192—106.2 **4 Claims**



1. A tuned damper disposed within a torque converter of an automatic transmission of an engine driven vehicle for overcoming vibrations in a clutch disposed within the torque converter for driving a torque converter turbine directly by the engine, comprising:

a clutch drive element having a rotatively rigid connection to the engine and a clutch engagement surface, and having an axis of rotation;

a clutch driven element having a rotatively rigid connection to the engine and a clutch engagement surface, and having an axis of rotation;

a clutch driven element having a clutch engagement surface complementary to the clutch engagement surface of the clutch drive element, selectively and frictionally engagable with the clutch drive element, having an axis of rotation common with the axis of rotation of the clutch drive element, having inertia about the axis of rotation, axially movable relative to the clutch drive element, and rotating with the clutch drive element after clutch engagement;

a clutch hub linking the clutch driven element and an output element and moving axially with the clutch driven element, rotatively fixed and axially movable relative to the output element;

clutch springs interposed between the clutch driven element and the clutch hub such that relative rotary movement between the clutch driven element and the clutch hub axially compresses the springs producing a torsional load between the clutch driven element and the clutch hub, providing a torsional spring rate between the clutch driven element and the clutch hub;

the clutch driven element and the clutch hub each having a corresponding plurality of openings for the disposition of the clutch springs, the openings being of approximately the same size and shape as the springs in their free state;

a natural frequency of rotary vibration for a driveline system dependent on the rotary inertia of the clutch driven element, on a torsional spring rate between the transmission and the clutch driven element primarily controlled by the torsional spring rate between the clutch driven element and the clutch hub, on a rotary inertia of rotating transmission components, on a rotary inertia of the vehicle as reflected through a final drive ration of the vehicle, and on a torsional spring rate of the vehicle primarily controlled by an axle spring rate;

a ring shaped inertia element centered relative to the axis of rotation of the clutch driven element in parallel with the output element; and

a visco-elastic material element with both torsional spring and torsional damping characteristics linking the ring shaped inertia element with the clutch driven element.

5,062,518

COIN VALIDATION APPARATUS

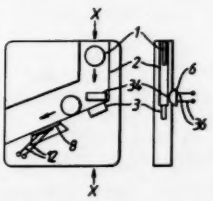
Clive L. Chitty, and Roger W. Whatmore, both of Northants, England, assignors to GEC Plessey Telecommunications Limited, Coventry, England

Filed Oct. 12, 1989, Ser. No. 420,188

Claims priority, application United Kingdom, Sep. 20, 1988, 8822115

Int. Cl.[5] G07D *5/04*

U.S. Cl. 194—317 **11 Claims**



1. Coin validation apparatus comprising a coin chute including a hard striking surface upon which a coin entering the apparatus is directed, a microphone positioned to detect acoustic vibrations of the coin after striking said surface, an output from said microphone being applied to signal processor means to produce a dynamic signal analysis of the coin vibrations, weigh-bridge measuring apparatus comprising a flexible strip of resilient material which is carried on a support at each end, guide means for permitting the said coin to be rolled along the whole length of the strip thereby causing a temporary deflection of a centre portion of said strip, and a strain gauge located at the strip centre portion effective to produce an electrical signal representative of the deflection which is induced in the strip, comparison means for enabling the resulting vibration spectrum and electrical signal to be compared with stored data representative of a set of standard coins, and output means arranged to indicate which coin value of the expected set has entered the apparatus.

5,062,519

ESCALATOR SYSTEM WITH CONVERTIBLE STEP UNIT

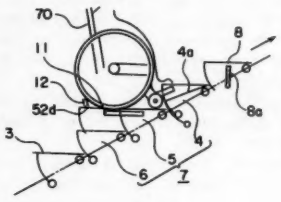
Yasumasa Haruta, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 30, 1990, Ser. No. 530,797

Claims priority, application Japan, May 31, 1989, 1-137637; May 31, 1989, 1-137638

Int. Cl.[5] B66B *23/12*

U.S. Cl. 190—333 15 Claims



1. An escalator system comprising:

a main frame defining a circulating loop path;

a plurality of steps connected in an endless step loop disposed in said loop path;

a convertible step unit disposed in said step loop, at least one step in said unit having a movable member disposed in a first position during an ordinary operating mode and disposed in a second position during a special operating mode;

a displacement mechanism, associated with the movable member and connected to said convertible step unit, for displacing the movable member of said convertible step unit between the first position and the second position by a drive force of said step loop which is a drive force component in the direction of width of a step; and

a movable guide rail unit engageable with said displacement mechanism during the special operating mode which moves said displacement mechanism in the step width direction by a camming action of said guide rail and converts said convertible step unit.

5,062,520

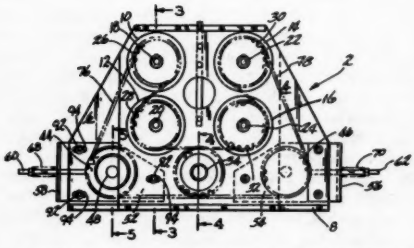
SELF ADJUSTABLE HANDRAIL DRIVE WITH SEPARATE DRIVE CHAINS

Dat Nguyen, New Britain; Frank Sansevero, West Hartford; Gerald E. Johnson, Farmington, and James A. Rivera, Bristol, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jul. 11, 1990, Ser. No. 550,926

Int. Cl.[5] B66B *23/02*

U.S. Cl. 198—335 7 Claims



1. A handrail drive assembly for a moving handrail, said assembly comprising:

a) a first pair of drive rollers mounted on first rotatable drive roller shafts, said first drive rollers forming a first nip through which the handrail passes;

b) first rotatable end bearings supporting opposite ends of said first drive roller shafts, said first end bearings being mounted eccentrically of said first drive roller shafts;

c) a second pair of drive rollers mounted on second rotatable drive roller shafts, said second drive rollers forming a second nip adjacent said first nip, and through which the handrail passes;

d) second rotatable end bearings supporting opposite ends of said second drive roller shafts, said second end bearings being mounted eccentrically of said second drive roller shafts; and

e) first and second second separate drive chains for separately rotating said first and second drive rollers and drive roller shafts respectively in said first and second end bearings whereby the axes of said drive rollers in each of said first and second pairs thereof move toward each other due to the eccentricity of said shafts and bearings to increase nip pressure on the handrail responsive to resistance to movement of the handrail.

5,062,521

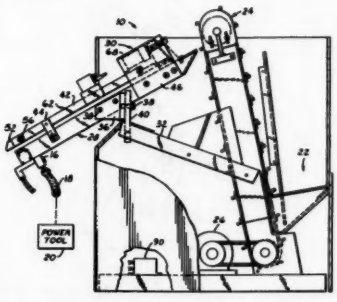
ARTICLE ORIENTING APPARATUS

Edward N. Hockman, Auburn Hills, Mich., assignor to Clyde Corporation, Rochester Hills, Mich.

Filed Jan. 31, 1990, Ser. No. 473,216

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—389 5 Claims



1. An apparatus for orienting articles each having a head and a shank comprising, a track having a pair of generally parallel and laterally spaced apart rails constructed and arranged to receive a head of an article thereon with at least a portion of the shank thereof depending therebetween, said track sloping downwardly such that articles received thereon slide toward the lower end thereof, a movable finger overlying said track, disposed between the ends thereof and having a gate opening therethrough adjacent said track which is constructed and arranged to permit only articles properly oriented on said track with their heads on said rails and their shanks depending therebetween to pass through said finger from a location on said rack upstream of said finger to a location downstream thereof, said finger also being constructed and arranged to prevent articles received on said track in any other orientation from moving downstream thereof and having means thereon to remove improperly oriented articles on said track therefrom when said finger is reciprocated longitudinally of said track, a mounting plate carried by said track, a way secured to said mounting plate and constructed and arranged to slidably receive said finger thereon for reciprocation generally longitudinally of said track and to prevent rotation thereof, a drive operably connected with said finger for moving said finger relative to said track to engage and remove improperly oriented articles therefrom while permitting properly oriented articles to pass through the gate thereof, said drive comprising a ram carried by said mounting plate, having a piston rod

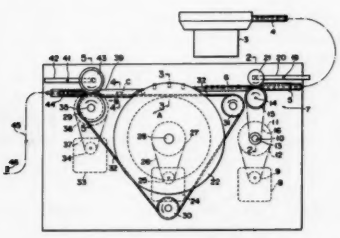
releasably connected to said finger, and constructed and arranged to reciprocate said finger on said way generally longitudinally of said track, and article delivery means associated with said track and constructed and arranged to periodically dump articles onto said track from a location above and spaced from said track and upstream of said finger, whereby articles dumped by said delivery means fall by gravity onto said track and which are oriented with their heads received on said rails and their shanks depending therebetween will move along said track through said gate of said finger and downstream thereof and articles from said delivery means remaining on said track in any other orientation will be removed from said track by movement of said finger and prevented from moving on said track downstream of said finger such that only articles with their heads bearing on said rail and having their shanks depending therebetween are received on said track downstream of said finger.

5,062,522

DEVICE FOR ALIGNING ARTICLES HAVING DIFFERENT DIAMETERS AT THEIR HEAD AND TAILS ALONG A SELECTED DIRECTION OF MOVEMENT WHILE CONCURRENTLY ORIENTING THEIR HEADS EITHER FORWARDLY OR REARWARDLY RELATIVE TO THAT DIRECTION

Takayoshi Sagawa, Hiratsuka; Shichisei Tani, Yokohama, and Katsuo Kato, Hiratsuka, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Mar. 23, 1990, Ser. No. 497,916
Claims priority, application Japan, Mar. 29, 1989, 1-75045
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—400 **6 Claims**



1. A device for aligning rod-like articles which have different diameters at their heads and tails in a selected direction and for orienting their said heads forwardly relative to said selected direction, said device comprising:

a drum mounted for rotation in a plane along a path of conveyance of said articles, said drum including a pair of spaced-apart side rims each having a circumferential edge, said side rims defining therebetween a circumferential groove in said drum having a width larger than the diameter of the tails of said articles but smaller than the diameter of the heads thereof, and a depth greater than the length of the tails;

a feed-in conveyor means for successively supplying the articles onto an uppermost circumferential portion of said drum in such a manner that the articles are suspended by said drum during rotation thereof with their heads being dependently supported by means of said circumferential edges of said side rims with their respective tails hanging downwardly into said groove defined between said side rims;

feed-out conveyor means for receiving the articles conveyed from said feed-in conveyor means by said drum, said tails of said articles hanging in the groove on the uppermost circumferential portion of the drum being contacted first by the feed-out conveyor means, and wherein

said feed-out conveyor means includes a belt which is stretched along plural pulleys and passes through the groove at the uppermost circumferential portion of the drum such that the articles are transferred to said belt by said rum, and wherein

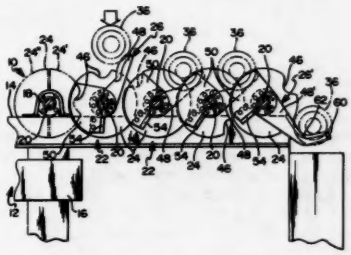
said belt operates at a slower speed as compared to the peripheral speed of the drum to provide means which causes said heads of said articles to be oriented forwardly relative to said tails.

5,062,523

CONVEYOR FOR SHAFT-LIKE PARTS

Roger L. Lenz, Dimondale, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1990, Ser. No. 569,150
Int. Cl.[5] B65G *29/00*
U.S. Cl. 198—463.4 **8 Claims**



1. A transfer apparatus for moving shaft-like parts from one station to another comprising:

a frame supporting a linear array of horizontal parallel rotors, each rotor mounted for rotation about its axis;

drive means coupled to the rotors for continuously driving the rotors for uninterrupted rotation;

each rotor including a pair of spaced discs mounted for rotation with the respective rotor, the discs of each rotor overlapping and axially spaced from the discs of adjacent rotors;

each pair of discs having aligned notches for receiving a part and carrying the part in the direction of disc rotation; and

gate means responsive to the presence of a first part engaged by a pair of discs for preventing the movement of a second part into the notches of a pair of discs already engaging the first part.

5,062,524

COURSE CHANGING DEVICE FOR CONVEYER SYSTEM

Yoshihisa Nozaki, Toyokawa; Takashi Inden, and Tohur Takemura, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 25, 1990, Ser. No. 558,079
Claims priority, application Japan, Jul. 26, 1989, 1-193129
Int. Cl.[5] B65G *29/00*
U.S. Cl. 198—465.4 **13 Claims**

1. A course changing device employed in a conveyer system, wherein carrier members carrying workpieces are conveyed among a plurality of working stations by way of said course changing device, said conveyer system including guide means for guiding said carrier members in a predetermined direction, and feeding means for conveying said carrier members along said guide means, said course changing device comprising:

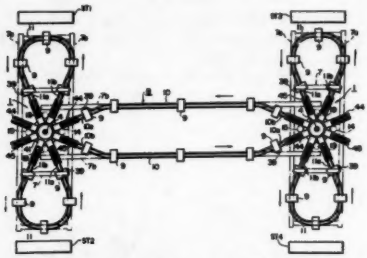
a rotating member for being driven to rotate;

drive means for driving said rotating member;

a plurality of support means provided on said rotating member for guiding and supporting said carrier members, said plurality of support means being radially arranged, each of said support means having an outer end and an inner end

being rockable with respect to the outer end thereof so that the inner end of each of said support means is capable of being rocked between an upper position and a lower position;

shifting means for driving said support means to be shifted between said upper and lower positions, wherein said support means is capable of sending said carrier member supporting thereon to said guide means when said support



means is shifted to said upper position by said shifting means, and wherein said support means is capable of receiving said carrier member from said guide means when said support means is shifted to said lower position by said shifting means; and

control means for controlling said drive means in accordance with the station which said carrier member supported by said plurality of support means is directed to.

5,062,525

PRODUCTION MACHINE INCORPORATIONG A HIGH-SPEED LIFT AND CARRY DEVICE WITH DOUBLE WALKING BEAM, AND THE PRODUCTION SYSTEM IMPLEMENTING THIS TYPE OF MACHINE

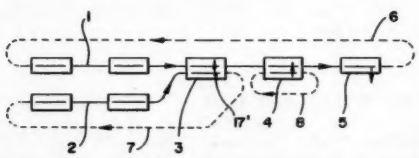
Claude Terracol, Eybens; Patrick Bredel, St. Martin D'Heres, and Jean-Laurent Guillet, Eybens, all of France, assignors to Merlin Gerin, Meylan, France

Filed Sep. 24, 1990, Ser. No. 587,355

Claims priority, application France, Sep. 22, 1989, 89 12558

Int. Cl.[5] B65G *27/34*

U.S. Cl. 198—468.6 **9 Claims**



1. An automated conveyorized production apparatus, comprising:

a conveyorized main track for transporting a plurality of palettes;

a conveyorized branch track for transporting a plurality of palettes, wherein at least a first segment of said main track and a corresponding second segment of said branch track are adjacent to each other and arranged in parallel, palettes transported across said first segment and said second segment being synchronized to move at the same speed;

first walking beam lift and carry means forming a part of said first segment for transporting a plurality of palettes along said main track;

second walking beam lift and carry means forming a part of said second segment for transporting a plurality of palettes along said branch track; and

transfer handling means disposed at a location along said first segment and said second segment for directly transferring an item from a palette of said branch track disposed on said second lift and carry means to a corresponding palette of said main track disposed on said first lift and carry means before subsequent movement of said corresponding palette along said main track.

5,062,526

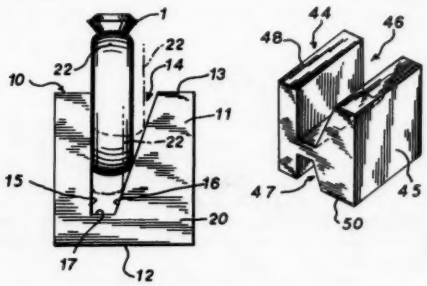
JEWELRY DISPLAY DEVICE

Alan S. Rudnick, and Lance N. Janke, both of Rte. 3, Plymouth, Wis. 53073

Filed Dec. 18, 1989, Ser. No. 452,213

Int. Cl.[5] B65D *6/04*

U.S. Cl. 206—6.1 **1 Claim**



1. A display device for rings comprising:

a rigid unitary body having a lower supporting base portion and an upper surface portion;

a wedge-shaped notch in said body, said notch having an open upper end in said upper surface portion;

said notch being defined by a pair of opposed upwardly divergent planar surfaces, which surfaces are perpendicular to a common plane; and,

a second wedge-shaped notch in said body, said second notch having an open lower end in said base portion;

whereby rings of varying band widths may be inserted and held between said divergent surfaces by a wedging action.

5,062,527

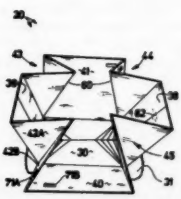
FOLDABLE, LEAKPROOF MULTI-MODE CARTON CONSTRUCTION

Frank E. Westerman, 30 Woodberry Rd., Little Rock, Ark. 72212

Filed May 21, 1990, Ser. No. 526,032

Int. Cl.[5] B65D *5/36*

U.S. Cl. 229—117 **44 Claims**



1. A blank adapted to be folded into a slotless carton without natural leak paths for safely containing contents such as medical waste, said blank comprising:

center panel means for integrally forming a continuous, slotless floor of said carton, said center panel means comprising a top, a bottom, and a pair of spaced apart sides;

width panel means integral with said center panel means for forming end walls of said carton, said width panel means adjoining said center panel means at said top and said bottom;

length panel means integral with said center panel means and said width panel means for forming side walls of said carton, said length panel means adjoining said center panel means at said sides;

corner panel means for yieldably bending into said carton interior when said blank is folded into said carton, said corner panel means integral with said center panel means, said width panel means, and said length panel means; and

score line means for facilitating folding of said width panel means, said length panel means, and said corner panel means, thereby enabling the formation of said carton.

5,062,528

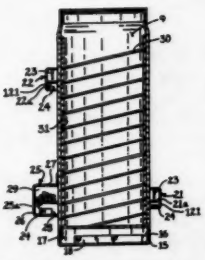
HEATED GOLF BAG APPARATUS

Bobby V. Whitaker, Jr., 531 Hartfield St., Jackson, Miss. 39216

Filed Nov. 13, 1990, Ser. No. 612,546

Int. Cl.[5] A63B *55/00*; F24S *7/10*; H05B *3/06*

U.S. Cl. 206—315.3 **7 Claims**



1. A heated golf bag apparatus comprising, in combination, an elongate longitudinally aligned bag, the bag including a lower compartment fixedly mounted to a lower end of the bag, with the lower compartment defining an enclosed lower chamber, the enclosed lower chamber including a rechargeable battery positioned therewithin, and

a helically wound heating coil mounted coextensively within the bag above the lower compartment, with the heating coil in operative association with the battery.

5,062,529

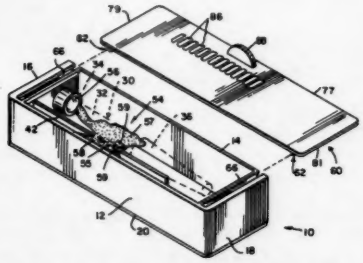
ENCLOSURE FOR CURLING IRON OR SIMILAR ARTICLE

Connie D. Blair, 5073 Madison St., Gary, Ind. 46408

Filed Nov. 14, 1988, Ser. No. 271,330

Int. Cl.[5] B65D *85/20*

U.S. Cl. 206—349 **21 Claims**



1. An enclosure storing a curling iron, comprising:

a front member having a top and a bottom;

a back member having a top and a bottom;

a first side member having a top and a bottom;

a second side member having a top and a bottom;

a floor member attached to said bottom of said front member, to said bottom of said back member, to said bottom of said first side member and to said bottom of said second side member;

a partition member attached to at least one of said first side member and said floor member;

a first section on a first side of said partition member receiving a handle of said curling iron, said handle having a first end and a second end, and receiving an elongate heatable element of said curling iron, said elongate heatable element having a mounted end attached to said first end of said handle and a free end;

a second section on a second side of said partition member receiving an electrical power cord fixedly attached to said second end of said handle of said curling iron;

a cover removably attached to said top of said front member, to said top of said back member, to said top of said first side member, and to said top of said second side member; and

said cover includes ventilation means for providing air circulation between the exterior and the interior of said enclosure.

7. A combination of a curling iron and an enclosure of same, comprising:

a handle with a first end and a second end;

an elongate heatable element having a free end and a mounted end attached to said first end of said handle;

an electrical power cord fixedly attached to and extending from said second end of said handle;

a front member;

a back member;

a first side member;

a second side member;

a floor member attached to each of said front member, said back member, said first side member and said second side member; and

partitional means separating said handle and said elongate heatable element from said electrical power cord within said enclosure.

20. An enclosure storing a curling iron, comprising:

a front member having a top and a bottom;

a back member having a top and a bottom;

a first side member having a top and a bottom;

a second side member having a top and a bottom;

a floor member attached to said bottom of said front member, to said bottom of said back member, to said bottom of said first side member and to said bottom of said second side member;

a partition member attached to at least one of said first side member and said floor member;

a first section on a first side of said partition member receiving a handle of said curling iron, said handle having a first end and a second end, and receiving an elongate heatable element of said curling iron, said elongate heatable element having a mounted end attached to said first end of said handle and a free end;

a second section on a second side of said partition receiving an electrical power cord attached to said second end of said handle of said curling iron;

a cover removably attached to said top of said front member, to said top of said back member, to said top of said first side member, and to said top of said second side member; and

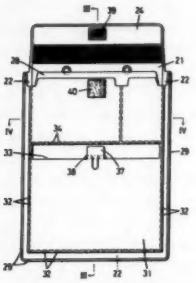
said cover includes at least one elongated projection which is slideably received into at least one track, said track being located in at least one of said top of said front member, said top of said back member, said top of said first side member and said top of said second side member.

5,062,530

COMPACT FILE FOR LETTERS AND OTHER DOCUMENTS

Masuhiro Mitsuyama, 1071, Kinugasa, Wake-cho, Wake-gun, Okayama, Japan

Filed May 30, 1990, Ser. No. 530,397
Claims priority, application Japan, Feb. 20, 1990, 2-16421[U]
Int. Cl.[5] B65D *85/00, 27/08*
U.S. Cl. 206—425 **12 Claims**



1. A file comprising:

a rigid plate having a top edge, a bottom edge, two side edges, a front surface and a rear surface;

a cover sheet having a top edge, a bottome dge, and two side edges, said cover sheet being attached along its two side edges to said two side edges, respectively, of said rigid plate, said cover sheet further being attached along its bottom edge to said bottom edge of said rigid plate but being separable along said top edge of said cover sheet from said rigid plate, such that said cover sheet is adjacent said front surface of said rigid plate and a pocket is formed between said rigid plate and said cover sheet;

said rigid plate comprising a flat rigid member, and means mounted to said rigid member for allowing a space to be formed between said top edge of said rigid plate and said top edge of said cover sheet when said rigid plate is held firmly and said top edge of said cover sheet is pulled forwardly away from said rigid plate; and

said means for allowing a space to be formed comprises pliable portions attached to said rigid member and extending laterally outwardly therefrom along both side edges thereof, said side edges of said cover sheet being attached along said pliable portions such that, when said rigid plate is held firmly and said top edge of said cover sheet is pulled forwardly away from said rigid plate, said pliable portions bend forwardly to allow said top edge of said cover sheet to move forwardly relative to said rigid plate.

5,062,531

MEDICINE CADDY OR TRAY

Walter G. Coy, 36652 Six Mile Rd., Livonia, Mich. 48152

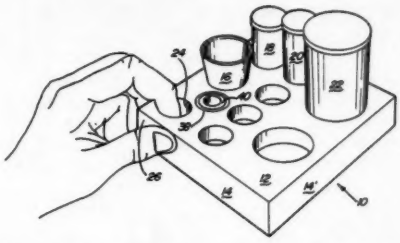
Filed Mar. 20, 1989, Ser. No. 325,949
Int. Cl.[5] B65D *1/36*
U.S. Cl. 206—564 **6 Claims**

1. A tray for removably holding one or more medicine containers, said tray comprising:

a body having a plurality of medicine-container holding recesses defined therein, said body including at least three sides, a substantially planar base, and a substantially planar top, said recesses being defined in said top;

said body being composed of a lightweight, resiliently flexible and expanded polymerized material, whereby said one or more medicine containers may be firmly but removably held;

means for altering the inner diameter of at least one of said plurality of said recesses, said means for altering the inner diameter comprising at least one selectively removable and reinsertable concentric sizing ring having a diameter smaller than the diameter of said one of said plurality of recesses, said at least one ring being adapted to be received in said one of said plurality of recesses, said at least one ring being tubular and cylindrical in shape and having an axial length substantially the same as depth of said recess so that, upon insertion of said ring into said recess, a top surface of said at least one ring is substantially flush with a top surface of said body;



said means for altering being composed of a lightweight, resiliently flexible and expanded polymerized material, whereby said one or more medicine containers may be firmly but removably held;

said at least one sizing ring being firmly but removably held in said body;

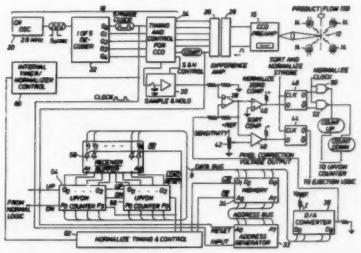
means for grasping, said means for grasping comprising an aperture defined in said top for receiving an index finger when two of said at least three sides are pinched between the thumb and the second finger of a user's hand.

5,062,532

SORTING MACHINE INCLUDING PHOTO SITE PROCESSING

George A. Zivley, Houston, Tex., assignor to ESM International, Inc., Houston, Tex.

Filed May 7, 1990, Ser. No. 519,886
Int. Cl.[5] B07C *5/342*
U.S. Cl. 209—581 **5 Claims**



1. In a sorting machine having at least one channel through which fungible products to be sorted flow, are electro-optically observed in a viewing window, and cause a defect signal to occur when observed to be substandard, the improvement comprising

separate photodetectors for observing a respective one of a plurality of photo sites of the viewing window and producing an electrical output proportional to the respective photo site light intensities,

timing-and-control means for controllably separably enabling each of said photodetectors during a sample period of time, and

processing means for individually processing the respective photo site electrical outputs to determine when a successive number of adjacent ones of them are outside of a

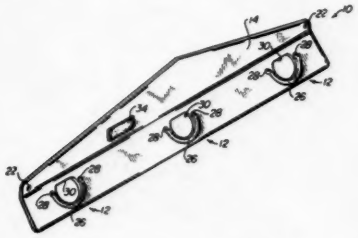
predetermined acceptable standard to produce a reject output.

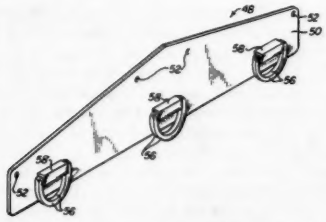
5,062,533

BAG HOLDER FOR RECYCLABLE MATERIAL

William H. Fickes, 4503 Club House Dr., Marietta, Ga. 30066, and Edward A. Fickes, Plano, Tex., assignors to William H. Fickes, Marietta, Ga.

Filed Sep. 18, 1990, Ser. No. 584,458
Int. Cl.[5] B42F *17/00*
U.S. Cl. 211—12 15 Claims





1. A holder for suspending bags for collecting materials therein, comprising an upper body portion having a generally planar configuration and adapted for parallel securement to a generally vertical surface, a lower body portion extending angularly from said upper body portion and away from said vertical surface, and securing means on said lower body portion for receiving and securing a bag or the like, including an aperture formed in said lower body portion with a ring means disposed in close proximity to said aperture and adapted to pivot toward and away from said lower body portion for receiving a portion of a bag through said aperture and said ring means and between said ring means and said lower body portion.

5,062,534

FABRIC SAMPLE DISPLAY

Paula Neustat, and Larry Marchiony, both of New York, N.Y., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 28, 1990, Ser. No. 500,602
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—48 20 Claims

1. A display for fabric samples, comprising:

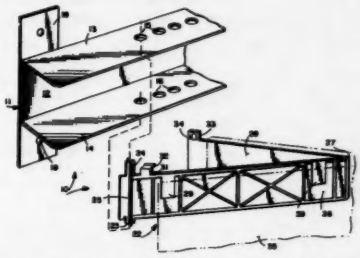
(a) a stationary support;

(b) a cantilever arm;

(c) said cantilever arm comprising a first section, and a second section pivotally mounted by hinge means for movement about a generally vertical axis with respect to said first section;

(d) means for mounting said cantilever arm to said support so that said arm first section extends outwardly therefrom and generally horizontally; and

(e) means for mounting a fabric sample to both sections of said cantilever arm so that said fabric sample may assume a low volume configuration when said second section is pivoted to a position generally parallel to said first section, or a deployed configuration when said second section is



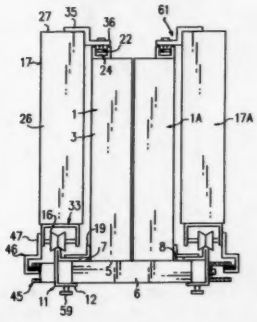
pivoted to extend substantially in line with said first section.

5,062,535

SIDE-SLIDING STORAGE RACK FOR 3480 CARTRIDGES

Frank Potter, P.O. Box 538, Syosset, N.Y. 11791

Filed Feb. 15, 1991, Ser. No. 656,215
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—162 9 Claims



1. An extendable assembly of cartridge storage stationary racks and a cartridge storage slide rack that is slidable relative to the stationary racks, the assembly comprising: multiple stationary racks, removable brackets connecting the stationary racks in end-to-end relation, a roller engageable channel track mounted along a top wall of each stationary rack in end-to-end abutting relation with similar tracks mounted along the top walls of neighboring stationary racks, each track being open along its top and at its ends to provide a continuous channel track with adjoining tracks; a separate base upon which each stationary rack is individually mounted, each base having a shoulder extending along a front of the rack mounted upon the base and having a shoulder extending along a rear of the rack; a separate rail track unit supported upon the shoulder fronting each stationary rack, each rail track unit having a front wall and a top wall extending rearwardly from the front wall, means securing the top wall to the stationary rack, the top wall having a narrow raised portion extending along a front edge thereof, and means connecting the rail track units end-to-end whereby the narrow raised portions of the several units provide a continuous rail track fronting the stationary racks; a cartridge storage slidable rack unit comprising a slide rack for the storage thereon of cartridges, peripherally grooved rollers mounted to a bottom wall of the slide rack engaged for rolling along the rail track, and strap elements extending rearwardly from a top wall of the slide rack supporting rollers depending into the channel track, whereby the cartridge storage slidable rack unit is slidable along the rail and channel tracks, and

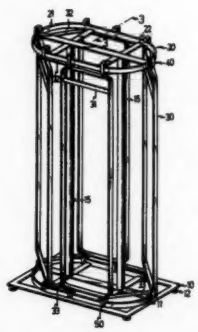
whereby the assembly is adapted to have additional slidable cartridge storage rack units added to it by entering the depending rollers of the additional rack units into the channel track through an open end of the channel track and by seating the peripherally grooved rollers of the additional rack units onto the rail track.

5,062,536

ROTATABLE HANGER ASSEMBLY

Huang S. Tsai, Taichung Hsien, Taiwan, assignor to Tung Keng Col, Ltd., Taichung Hsien, Taiwan and Tung Keng Col, Ltd., Taichung Hsien, Taiwan

Filed Nov. 15, 1990, Ser. No. 613,593
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—162 3 Claims



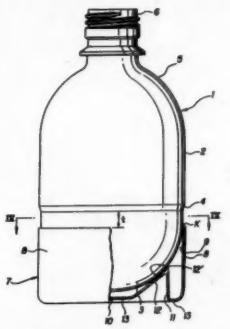
1. A hanger assembly comprising a base and an upper support coupled together by two posts, a first track which is endless being disposed on said base and having two side surfaces, said upper support having a second track which has a shape similar to that of said first track and which is disposed in parallel to said first track and which has two side surfaces, a plurality of frames, an upper portion of each of said frames being slidably coupled to said second track by two roller supports, each of said roller supports including a substantially C-shaped holder with a roller provided in an upper portion of said holder and with a pair of discs pivotally supported on a lower portion of said holder, said roller being straddled on said second track so that said roller support can slide freely along said second track, said discs slidably contacting said side surfaces of said second track so that said upper portion of said frame can be guided to slide along said second track, a lower portion of each of said frames being slidably coupled to said first track by two guides, a bar being laterally coupled to an upper portion of each of said frames so that clothes may be hung on said bar, an upper strip being pivotally coupled between two adjacent roller supports of every two adjacent frames, and a lower strip being pivotally coupled between two adjacent guides of every two adjacent frames so that said frames are pivotally coupled together by said strips and so that said frames move in concert along said first track and said second track and so that a great many clothes can be hung on either of said bars, and said clothes can be easily reached when said frames are rotated to slide along said first track and said second track.

5,062,537

BOTTLE-SHAPED CONTAINER WITH BASE CAP

Yoshiaki Hayashi, Matsudo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 489,216
Claims priority, application Japan, Mar. 9, 1989, 1-26779[U]
Int. Cl.[5] B65D 23/08, 25/24
U.S. Cl. 215—12.1 5 Claims



1. A bottle-shaped container with a base cap comprising:
a bottle including a body and a semispherical convex shaped bottom extending downward from the body; and
a cylindrical base cap securely attached to said bottom, said base cap providing support for the container; wherein
said body has a lower portion having a reduced diameter zone and a tapered zone for preventing a shrunk label attached thereto from slipping;
inlet means are formed between an outer periphery of an upper portion of the bottom and an inner periphery of an upper end of a cylindrical side wall of the base cap;
outlet means are formed in a bottom wall of the base cap for draining hot water from the base cap; and
an intermediary zone is formed on an outer surface of the body between the tapered zone and said upper end of the base cap to enable hot water to flow into the base cap through said inlet means.

5,062,538

PACKAGE WITH PRESSURE VENTING CLOSURE ACCEPTING DIFFERENT TYPES OF INSERT DISKS FOR DIFFERENT FOOD PRODUCTS

Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Packaging Company, Lancaster, Ohio

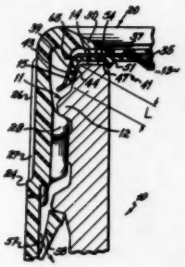
Continuation-in-part of Ser. No. 401,999, Sep. 1, 1989, Pat. No. 4,993,572, and a continuation-in-part of Ser. No. 402,211, Sep. 1, 1989, abandoned. This application Jun. 8, 1990, Ser. No. 535,114
The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.
Int. Cl.[5] B65D 51/16
U.S. Cl. 215—260 14 Claims

1. A package comprising a container and a pressure venting, side sealing closure,
said container having a finish with an opening and a top seal area around said opening, said top seal area comprising an upwardly facing annular area at the top of the finish,
said container also having a side seal area comprising an annular area extending downwardly and outwardly around said top seal area, said side seal area and said top seal area together having a width adequate for sealing meat products,
said container having external thread means for securing said closure;
said closure comprising,
an annular shell having a top opening and a skirt with internal thread means for engaging the thread means of said

container, said closure having a top lip which projects inwardly around said top opening,

an insert disk contained in said shell beneath said top lip, said insert disk having a downwardly opening gasket channel with an annular band at the top and a downwardly and outwardly angulated side seal flange around said band,

a gasket in said gasket channel, said gasket covering both said band and said flange and forming a seal with both said top seal area and said side seal area of said container,



said top lip of said closure having an undersurface with at least one bearing area for engaging said band above said gasket channel,

the said undersurface of said top lip also having at least one recessed area which does not bear on said disk, said recessed area permitting gas pressure in said container in excess of a predetermined limit to deflect the disk upwardly into said recessed area and away from said top seal area of said container sufficiently to release excess gas pressure.

5,062,539

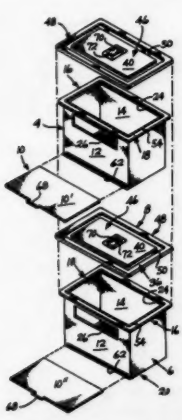
COMPARTMENTALIZED REFUSE CONTAINER

John W. Chandler, 131 NW. 55th St., Seattle, Wash. 98107

Continuation-in-part of Ser. No. 349,325, May 8, 1989. This application Jul. 25, 1990, Ser. No. 558,145

Int. Cl.[5] **B65D** *21/02*

U.S. Cl. 220—4.27 **12 Claims**



1. In an upright container for holding refuse and the like,

a pair of relatively upper and lower tube-like storage modules that are stacked on top of one another to form a joint therebetween,

a pair of panels which are removably insertable in the pair of modules to form false bottoms for the modules,

each module having an annular wall structure which is arranged upright in the container and defines the sides of the module and a hollow bin therewithin for refuse,

each wall structure having a relatively upper rim about the top thereof which forms first joint locking attachment means on opposing sides of the module at the top of the wall structure, and a relatively lower rim about the bottom thereof which forms second joint locking attachment means on opposing sides of the module at the bottom of the wall structure,

each wall structure having an opening at the top thereof that is formed within the relatively upper rim of the wall structure, an opening at the bottom thereof that is formed within the relatively lower rim of the wall structure, and a pair of additional openings in the body of the wall structure that are formed to open to the outside of the module at levels between the tip and bottom openings of the wall structure,

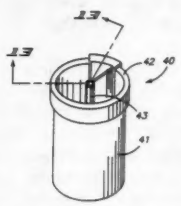
one of the additional openings in each wall structure being formed in a horizontal plane adjacent the bottom of the corresponding bin, and the other additional opening in each wall structure being formed at a level which is disposed above the one additional opening and relatively adjacent the top opening of the respective wall structure,

the one additional opening in each wall structure being generally rectangular in outline to form a horizontally extending slot-like recess in the bottom portion of the wall structure for receiving the respective panel for the module, the panel being removably insertable in the bin of the respective module through the recess, and there being means disposed about the bin at the level of the recess to support the panel crosswise of the bin at that level, so that when inserted the panel can serve as a false bottom for the bin, but will open the bin to the bottom opening of the wall structure when it is removed from the bin, and

coupler means which are removably interposed between the relatively upper and lower modules at the joint therebetween and have third and fourth joint locking attachment means on the opposing relatively upper and lower sides thereof, respectively, which are snap engageable with the second and first joint locking attachment means, respectively, on the relatively upper and lower rims of the relatively lower and upper modules, respectively, to form interfering male/female joints between the third and second joint locking attachment means and the fourth and first locking joint attachment means, respectively, that operate to interlock the modules for conjoint movement in the vertical directions thereof, when the relatively upper module is lifted in the vertically upward direction, but which are disengageable under a predetermined vertical force to enable the coupler means to be detached from the respective modules, and vice versa, when the modules are to be unloaded,

the other additional openings in the wall structures of the respective modules being adapted to form entry ports for loading refuse in the respective bins of the modules, so that two types of refuse can be loaded in the respective bins, with the panel of the relatively upper module segregating one bin from the other, and then when the container is to be unloaded, the two types can be separately unloaded through the respective top and bottom openings of the stack of modules, and/or through the respective top and/or bottom openings of the respective modules when the coupler means have been disengaged from at least one of the first and second attachment means and the respective modules have been relatively separated from one another by relatively lifting one module away from the other.

5,062,540
CONTAINER RECYCLING APPARATUS
Robert A. Jenkins, 2216 Division, Boise, Id. 83706
Filed Apr. 29, 1991, Ser. No. 693,157
Int. Cl.[5] B65F *1/08*
U.S. Cl. 220—23.83 **1 Claim**



1. A container recycling apparatus, comprising in combination,

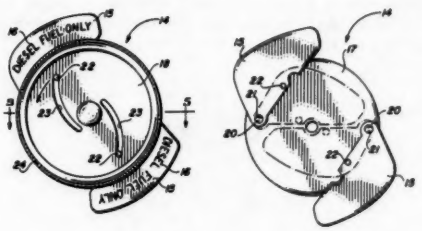
a rigid cylindrical container, the cylindrical container including a floor and an upper terminal edge, the upper terminal edge including an "L" shaped flange mounted circumferentially and continuously to the upper terminal edge extending exteriorly of the cylindrical container and downwardly along the cylindrical container in a spaced relationship relative to a cylindrical side wall of the cylindrical container, and the cylindrical container including a central shaft, the central shaft fixedly and coaxially mounted to the floor of the cylindrical container extending coextensively thereof from the floor to the upper terminal edge, and

a plurality of inserts, each insert of said plurality of inserts defining a cylindrical segment of a varying degree of arc, wherein each insert includes an "L" shaped lock flange, each lock flange complementarily receives the "L" shaped flange of the cylindrical container therewithin, and each "L" shaped lock flange includes a flange extension extending downwardly below the "L" shaped flange, wherein the "L" shaped lock flange and flange extension are flexible permitting manual displacement of the flange extension and "L" shaped lock flange relative to the "L" shaped flange permitting ease of removal of each of said inserts therewithin, and

each insert includes a positioning sleeve fixedly and coaxially mounted on each insert at a varying position among the inserts permitting positioning of said plurality of inserts within the cylindrical container, with the positioning sleeve of each respective insert displaced relative to an adjacent insert.

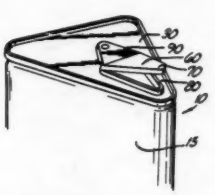
5,062,541
CLOSURE CAP
Vincent J. Galbo, Williamsville, N.Y., assignor to U-Haul International, Inc., Phoenix, Ariz.
Filed Mar. 22, 1990, Ser. No. 497,268
Int. Cl.[5] B15D *51/24*
U.S. Cl. 220—212 **7 Claims**

1. A closure cap for a fuel tank, said cap comprising first and second coaxially-mounted plate members adapted for relative rotational movement about their common axes, a flag member mounted on one of said plate members for movement between one position in which the flag is disposed substantially entirely within the periphery of the cap and another position in which the flag extends substantially beyond the periphery of the cap, means for causing said flag to move from its said one position to its said other position in response to relative rotating movement of said plate members, and indicia on said flag which is



covered when the flag is in its said one position and displayed when the flag is in its said other position.

5,062,542
EASY-OPEN AND RECLOSABLE CONTAINER
Jay Morton, Miami Beach, Fla., assignor to City of Hope, Duarte, Calif. and Lucille T. Morton, Miami Beach, Fla.
Division of Ser. No. 451,461, Dec. 13, 1989. This application Apr. 1, 1991, Ser. No. 678,859
Int. Cl.[5] B65D *17/32*
U.S. Cl. 220—269 **11 Claims**



1. An easy-open and reclosable container comprising:

a container body portion having a bottom end panel,

a container top lid having an opening,

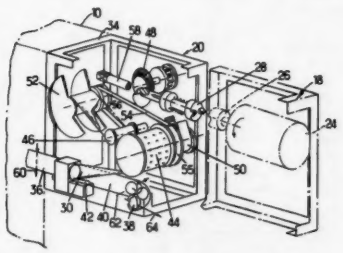
an openable and reclosable assembly including a bottom flange portion mounted on the inner surface of said top lid and having an elevated rim extending upwardly through said opening defining an aperture, a closure portion with a channel complementary in shape with said rim and hingedly connected to said rim in part, a tension controlling portion having a hole at one end separably engaged with an elevated locking rivet integrally fixed on said top lid, and the opposite end of said tension controlling portion joined to said closure member by a deformable hinge portion and having a locking lip, so that a pulling force will be applied on said closure portion while said hole is seated on said locking rivet and the pulling force will be released while said tension controlling member is lifted.

5,062,543

FOOD PELLET DISPENSING APPLIANCE

Jean-Claude Germain, Gif sur Yvette, France, assignor to Carrar, France

Filed Apr. 16, 1990, Ser. No. 508,720
Claims priority, application France, Apr. 14, 1989, 89 04993
Int. Cl.[5] G07F *11/72*
U.S. Cl. 221—30 11 Claims



1. Appliance for dispensing agglomerated pellets of food for animals or plants comprising:

a pipe having a thin wall of flexible material in which individual pellets are disposed in series relation as a stack and are retained against movement in said pipe;

a storage magazine having means for compactly storing said pipe and having an outlet guide tube for egress of said pipe; and

a dispenser comprising:

a frame;

a pellet collecting and delivering tube aligned with said outlet guide tube and separated therefrom by a gap;

stationary splitting means supported by the frame, located to engage the pipe and to cut it along a generatrix as it advances and leaves the guide tube for releasing the pellets; and

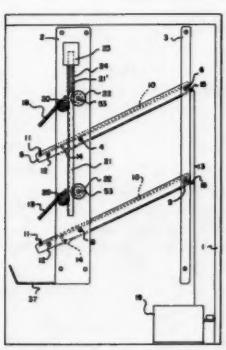
means for drawing said pipe along said guide tube and over said pellet collecting and delivering tube after it has been split and emptied and for flattening it prior to storage thereof on a motor driven spool.

5,062,544

AUTOMATIC DISPENSER FOR BAKERY PRODUCTS AND THE LIKE

Jean-Paul Buzy-Vigneau, Longwy, France, assignor to Lorraine Distribution Buzy-Vigneau, Longway, France

Filed Aug. 31, 1989, Ser. No. 401,124
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—130 20 Claims



1. An automatic dispenser for discrete items, comprising:

a plurality of inclined plates supported by first horizontal axles fixed to two sets of two vertical supports which are fixed to side walls of a frame of the dispenser and of which a first set is located in front of a second set, each inclined plate being extended by a rocker supporting the item to be dispensed, each rocker being fixed, via its lower face, with a second horizontal axle connected by means of a cable to a control unit located in the dispenser, the cable and the control unit being adapted to pivot the rocker about the axle; and

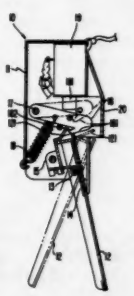
above each rocker, a retaining tongue fastened to a horizontal axle which is mounted pivotably on the first supports and which is fixed, at one end, to a toothed pinion located between the frame and the support and engaging with a rack extended in its upper part by a cylindrical rod, having an end which is seated in an electromagnet fixed to the support, the retaining tongue adapted to retain the item located immediately behind that situated on the rocker during dispensing of the item located on the rocker, the control unit and the electromagnets being subject to an electronic control to actuate rockers and retaining tongues in such a manner that the retaining tongue prevents motion of items into the rocker when the rocker pivots, the retaining tongue being lowered immediately before the rocker supporting the selected item pivots in order to free the item which falls into a container accessible to the user.

5,062,545

AUTOMATIC VENDING MACHINE DISPENSING MECHANISM

Toshiyuki Takamura; Kazunari Kurihashi, and Masazumi Harada, all of Gunma, Japan, assignors to Sanden Corporation, Japan

Continuation of Ser. No. 188,479, Apr. 29, 1988, abandoned.
This application Oct. 15, 1990, Ser. No. 598,790
Claims priority, application Japan, Apr. 30, 1987, 62-65774[U]
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—152 30 Claims



1. An automatic vending machine including at least one column for storing and dispensing merchandise, a discharge opening, and a dispensing mechanism, said column having at least one shelf for supporting merchandise, said dispensing mechanism comprising conveying means for conveying the merchandise through said discharge opening, and discharge control means for controlling the passage of said merchandise through said discharge opening, the improvement comprising:

said discharge control means comprising a control plate supported adjacent said discharge opening, biasing means for biasing said control plate toward said discharge opening and locking means for releasably locking said control plate, said locking means being movable from a first portion wherein said locking means locks said control plate and is in engagement therewith to a second position wherein said locking means releases said control plate and

is out of engagement therewith, said discharge control means further comprising locking means control means for controlling position of said locking means, and

wherein said discharge control means further comprises posture control means mounted adjacent said discharge opening for controlling the attitude of the merchandise while being dispensed so that the bottom of the merchandise is oriented downwardly.

5,062,546

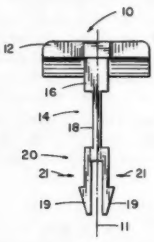
SNAP RIVET SAFETY LOCK FOR INFLATORS

Glenn H. Mackal, 4923 59th Ave. S., St. Petersburg, Fla. 33715

Filed May 15, 1990, Ser. No. 523,106

Int. Cl.[5] B67D *5/00*

U.S. Cl. 222—3 **2 Claims**



1. A safety lock for inflators of the type having a pivotally mounted bell crank activated by a lanyard, and of the type having a transversely extending bore formed in said inflator and said bell crank when said bell crank is in an unpivoted position; comprising:

a frangible rivet member of generally linear configuration being disposed within said bore;

said rivet member having a first head means and a pre-formed second head means;

a generally flat handle positioned in a first plane;

a linear in configuration main body that depends from said handle in orthogonal relation thereto;

said main body being disposed in said bore when said bell crank is in an unpivoted position relative to said inflator;

said handle being said first head means of said rivet member;

said main body including a bifurcated leading end, a medial part, and a trailing part;

said trailing part abutting said handle and being integrally formed therewith;

said leading end forming said pre-formed second head means;

said leading end including a pair of transversely spaced apart resilient prongs that transiently converge toward one another when inserted into said bore;

a laterally extending anti-retraction barb being formed on each of said prongs adjacent a leading edge thereof, said barbs engaging a rim of said bore when said main body is fully inserted into said bore, said barbs preventing inadvertent retraction of the rivet from the bore;

said trailing part of said main body having a transverse extent substantially equal to the diameter of said bore;

said medial part of said main body having a transverse extent substantially less than the transverse extent of said trailing part, said medial part being breakable when said lanyard is pulled firmly;

said prongs of said leading end of said main body having a collective breadth substantially equal to the transverse extent of said trailing part of said main body;

said leading end, medial part, and trailing part of said main body having a common thickness; and

said medial part having a longitudinal extent substantially equal to a longitudinal extent of said leading end and substantially equal to a combined longitudinal extent of said handle and said trailing part;

whereby said bell crank is keyed to said inflator by said frangible rivet member and held against pivoting relative thereto.

5,062,547

VOLUME MEASUREMENT AND DOSAGE DEVICE

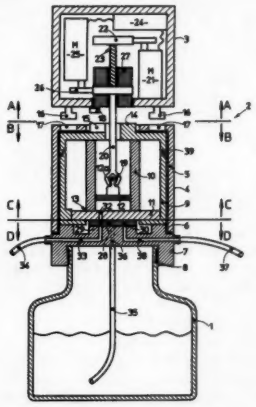
Paul Zähner, and Karl Kaempf, both of Herisau, Switzerland, assignors to Metrohm AG, Switzerland

Filed May 9, 1990, Ser. No. 520,817

Claims priority, application Switzerland, May 26, 1989, 1990/89

Int. Cl.[5] G01N *1/00*

U.S. Cl. 222—144.5 **12 Claims**



1. A volume measurement and dosage device comprising

a cylinder having a longitudinal axis and an end closure having an opening therein, said cylinder being supported about an axis of rotation,

a valve system comprising means defining at least two separate channels for fluid flow, a stationary valve element connected to each of said channels and having plural apertures therein,, one communicating with each of said channels, said cylinder end being in contact with the valve element, the apertures thereof being arranged so that said cylinder opening can be aligned with any of said apertures by rotating the cylinder,

a piston within the cylinder for displacing fluid in the cylinder, and

an actuating system for moving the piston relative to the cylinder to displace said liquid through said opening, thereby producing aspiration or delivery of the liquid through the passage aligned with the opening.

5,062,548

BEVERAGE DISPENSING SYSTEM

John B. Hedderick, Pinner; Brian R. Rutty, Weybridge; David G. Page, Swindon, and John J. Walshe, Minety, all of Great Britain, assignors to Arthur Guinness Son and Company (Great Britian) Limited, London, Great Britain

Continuation of Ser. No. 314,235, Feb. 21, 1989, abandoned, which is a continuation of Ser. No. 120,230, Nov. 10, 1987, abandoned, which is a continuation of Ser. No. 838,625, Mar. 11, 1986, abandoned. This application Jan. 28, 1991, Ser. No. 649,112

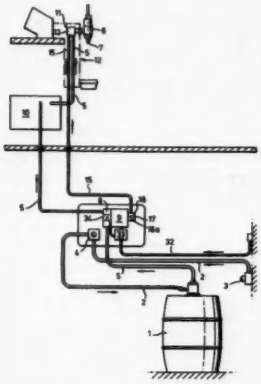
Claims priority, application United Kingdom, Mar. 11, 1985, 8506227

Int. Cl.[5] B67D *5/58*

U.S. Cl. 222—190 **19 Claims**

1. A beverage dispensing system comprising valve means controlling dispensing of the beverage through a supply pas-

sage which is intended to be connected to a bulk source of the beverage, and gasifying means for introducing at least one of nitrogen, carbon dioxide, and air gases into said beverage in the supply passage remote from the bulk source and during dispensing of the beverage, said gasifying means having an inlet for connection to a source of the gas under pressure; a capillary



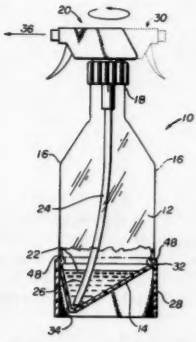
restrictor through which said gas is to be directed to the supply passage, said restrictor having a bore in the range of 0.05 to 0.4 millimeters diameter and a length in the range of approximately 25 to 1,000 millimeters, means for adjusting the pressure of the gas supplied to the capillary restrictor, and a non-return valve through which gas emanating from the restrictor is introduced to the beverage.

5,062,549

HAND HELD, DIP-TUBE STYLE LIQUID DISPENSER

David A. Smith, Midland, and Clark M. Woody, Bay City, both of Mich., assignors to DowBrands Inc., Indianapolis, Ind.

Filed Nov. 3, 1989, Ser. No. 431,418
Int. Cl.[5] B67D *5/40*
U.S. Cl. 222—377 **6 Claims**



1. An improved hand held, non-pressurized dispenser for liquids, comprising:

a container having an inclined bottom, sidewalls extending upwardly from said bottom, and an upper end;

dispensing means positioned adjacent said upper end of said contain for dispensing a liquid held in said container and communicated upward to said dispensing means;

a tube for communicating said liquid upward from a lower end of said tube to said dispensing means, said tube being of a sufficient length such that said lower end of said tube is urged by the inclined bottom towards a lowermost portion of said bottom when said container is oriented as in use; and

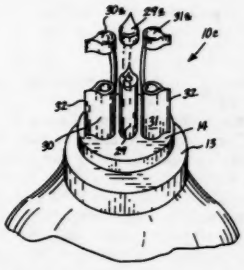
support means fastened to said container for supporting said container in a substantially upright position when not in use.

5,062,550

SELECTIVE FLOW DISPENSING CONTAINER

Bharat H. Singh, 1314 41st St., Brooklyn, N.Y. 11218

Filed May 24, 1990, Ser. No. 527,847
Int. Cl.[5] B67D *5/00*
U.S. Cl. 222—80 **2 Claims**



1. A selective flow dispensing container comprising, in combination,

a polymeric deformable container defined about a central axis, including a cap member mounted to an upper end of the container, the cap member including a rigid cap cover overlying the cap member enclosing the container, the cap cover including a first, second, and third fluid conduit integrally mounted to the cap cover, wherein each conduit is in fluid communication with contents contained within the container, and

wherein the first conduit includes a first opening at an upper terminal end thereof, the second conduit includes a second opening at an upper terminal end of the second conduit, and wherein the third conduit includes a third opening at an upper terminal end of the third conduit, the first opening is defined by a first diameter, the second opening is defined by a second diameter, and the third opening is defined by a third diameter, and

wherein the third diameter is greater than the second diameter, and wherein the second diameter is greater than that defined by the first diameter, and

the first, second, and third conduits are arranged parallel relative to one another and are arranged parallel to the axis defined by the container, and

the first conduit includes a first closure cap, the second conduit includes a second closure cap, and the third conduit includes a third closure cap, wherein each closure cap is individually secured to each respective conduit, and

each first, second, and third closure cap is secured to each respective first, second, and third conduit by a respective flexible band, and

wherein the first conduit, the second conduit, and the third conduit each include a knife edge integrally formed to each conduit.

5,062,551

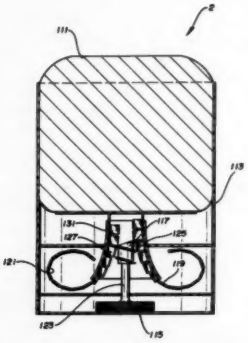
POSTLESS PUSHUP CONTAINER

Charles Goldstein, Ramapo Township, Rockland County, N.Y., and Kenneth P. Glynn, Raritan Township, Hunterdon County, N.J., assignors to Delta Dispensing, Inc., Flemington, N.J.

Filed Oct. 1, 1990, Ser. No. 596,785

Int. Cl.[5] B67D *5/42*

U.S. Cl. 222—390 **14 Claims**



1. An apparatus for storing and dispensing materials, said apparatus including:

a) a substantially hollow container having two ends, a dispensing end and a drive mechanism end, said dispensing end having at least one orifice for the exiting of material stored within said container;

b) at least one flexible band, said band having at least one front and rear surface, two side edges and two ends, said band having a plurality of side wall segments depending from at least one said side edge of said band, each said side wall segment being comprised of a substantially rigid member attached to said band by an interdepending flexible member, allowing said side wall segment to be elastically deformed into a plane substantially perpendicular to said band;

c) a piston attached to, and carried by at least one said flexible band;

d) a tapered conduit depending from said hollow container inner surface, said tapered conduit having two ends, an entrance end and an exit end, said tapered conduit narrowing to a width not substantially wider than said band, wherein the passage of said band through said conduit causes said band side wall segments to deform into an orientation substantially perpendicular to said band and causes said band to have a linear orientation substantially perpendicular to said piston; and

e) a means of driving said band through said conduit, wherein said means engages at least one said band.

5,062,552

SPOUT FOR DIFFERENT SIZE CANS

Walter Heubel, Bergstrasse 7, 8901 Aystetten, Fed. Rep. of Germany

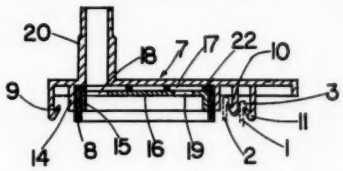
Filed Jan. 11, 1990, Ser. No. 463,509

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1989, 8900273[U]

Int. Cl.[5] B65D *25/48*

U.S. Cl. 222—570 **9 Claims**

1. A cap arrangement for cans having a lid edge bead and a lid with a lid wall part that may be opened to form a pouring opening, comprising: a cap body formed of plastic positionable over said lid, said cap body including a sealing ring engageable with the lid wall part surrounding the opening, said cap body including a single front edge web for gripping behind said lid edge bead, said front edge web having a curvature substantially corresponding to a curvature of the lid bead and plural individual webs spaced radially from said front edge web, said individual webs being positioned at radially spaced locations



from one another corresponding to a thickness of the lid edge bead to provide an outer individual web and an inner individual web with respect to the can.

5,062,553

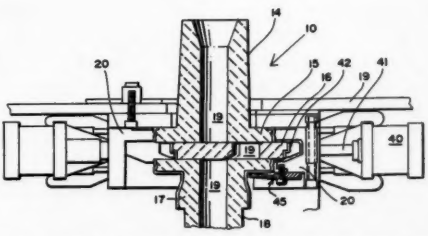
CANTILEVER SPRING MOUNT FOR SLIDING GATE VALVE AND METHOD

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Continuation-in-part of Ser. No. 494,587, Mar. 16, 1990. This application Jun. 18, 1990, Ser. No. 539,582

Int. Cl.[5] B22D *41/08*

U.S. Cl. 222—590 **13 Claims**



1. In a sliding gate valve, a cantilever spring for use in said sliding gate valve, said valve having a frame, said frame having cantilever spring mounting means, and a plurality of refractory members contained by said frame with each refractory member having an orifice for teeming steel when in alignment and controlling the flow of steel or shutting it off when misaligned comprising,

said cantilever spring formed for mounting to said valve frame cantilever spring mounting means at a lower portion thereof,

a body having a length at least twice the thickness,

a heel portion of said spring body,

mounting means provided for the heel portion,

a cantilever portion of said spring body extending from the heel portion,

said cantilever spring portion having a working face proportioned to engage an adjacent refractory member,

and means for securing said cantilever spring to the valve.

5,062,554

SLIDING NOZZLE DEVICE

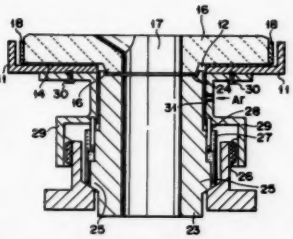
Hiroshi Sakai; Masamichi Asai, both of Kariya; Kenzo Hayashi, Okazaki; Kazunori Sakurai, Wakayama, and Kazuhiko Watanabe, Kariya, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 444,974, Dec. 4, 1989, abandoned. This application Feb. 28, 1991, Ser. No. 662,514

Claims priority, application Japan, Feb. 13, 1989, 1-33163

Int. Cl.[5] B22D *41/08*

U.S. Cl. 222—600 6 Claims



1. A sliding nozzle device comprising:

a metallic case having an opening at its central area;

a refractory plate secured to the metallic case and having a discharge hole at its central area to allow a molten metal to be discharged, said refractory plate being disposed in the opening of the metallic case;

a metallic hoop wound around an outer periphery of the refractory plate;

an immersion nozzle mounted on the refractory plate and having a swollen region along an outer periphery of a lower portion thereof;

a female member outwardly projecting in a direction perpendicular to an outer surface of the metallic hoop;

fastening means for fixing the female member to the metallic case under an action of a vertical force;

a holder support member fixed to the bottom of the metallic case; and

a holder provided near the swollen region of the immersion nozzle in a manner to be fitted into the holder support member.

5,062,555

MICROPROCESSOR BASED RATIO ADJUSTMENT AND PORTION CONTROL SYSTEM FOR POSTMIX BEVERAGE DISPENSING VALVES

Roger C. Whigham, Atlanta, and George H. Hoover, Marietta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Apr. 3, 1989, Ser. No. 332,644

Int. Cl.[5] G04C *1/12*

U.S. Cl. 222—641 2 Claims

1. In a postmix beverage dispensing valve including a valve body, a valve cover including a front panel, a water circuit through said body, a syrup circuit through said body, a water solenoid controlling flow through the water circuit, a syrup solenoid controlling flow through the syrup circuit, an adjustable water flow control, an adjustable syrup flow control, a plurality of cup size selection buttons and a Pour/Cancel button on said front panel, and a nozzel for dispensing a beverage mixture of syrup and water, the improvement comprising:

(a) a control system of easily adjusting the ratio of water to syrup;

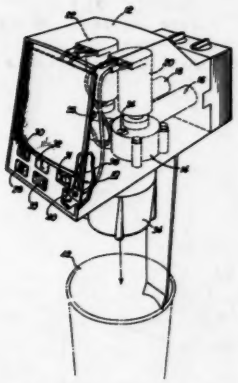
(b) said control system including a microprocessor based control circuit mounted inside said cover;

(c) said circuit including:

(i) means for dispensing water for a predetermined period of time; and

(ii) means for dispensing syrup for a predetermined period of time; and

(d) a volume measuring cup having a water level mark and



a syrup level mark, whereby, the water and syrup flow controls provides a means that is adjusted if the dispensed water and syrup volumes do not identically match said marks.

5,062,556

MOLDED PLASTIC GARMENT HANGER WITH INTEGRAL CLIPS

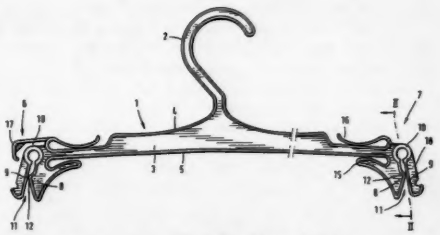
Wilhelm Willpütz, Köln, Fed. Rep. of Germany, assignor to W. Willpütz Kunststoffverarbeitungs GmbH, Köln, Fed. Rep. of Germany

Filed Feb. 28, 1990, Ser. No. 486,525

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 8902362[U]

Int. Cl.[5] A47G *25/48, 25/14*

U.S. Cl. 223—96 13 Claims



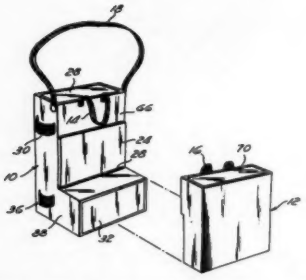
1. A clothes hanger of a synthetic plastic material, comprising a main part a substantially vertical web wall, and an upper flange and a lower flange having a width greater than that of said web wall, said main part having two ends; a clamp provided at each of said ends of said main part and including a substantially rigid abutment part and a tongue connected with said abutment part so that a gap is formed between said abutment part and said tongue for inserting an article of clothing to be clamped; and means for connecting said abutment part and said tongue with one another and including a substantially freely lying synthetic plastic ring-shaped arc interrupted by said gap and connecting said abutment part with said tongue so that said tongue is pressed toward and abuts against said abutment part with a prestress under a springy action produced solely by said arc, said synthetic plastic arc having a width which is greater than a width of said upper flange and said lower flange and said clothes hanger further comprising a shoulder projection formed in alignment with said upper

flange on said main part above said synthetic plastic arc overlapping said arc at a distance therefrom.

5,062,557
INFANT CARE BAG

A. Pascal Mahvi, and Caryl L. Mahvi, both of 17 Montpellier, Newport Beach, Calif. 92660

Filed Oct. 13, 1989, Ser. No. 421,530
Int. Cl.[5] A45F *4/04*
U.S. Cl. 224—153 **11 Claims**



3. An infant care bag for conveniently transporting a variety of infant care items, for providing a booster seat, and a changing pad, and for cooling food and beverage items, comprising:

(a) a primary bag section having a plurality of closable compartments;

(b) a removable auxiliary bag section removedly attached to said primary bag section, said removable auxiliary bag section having at least one closable compartment formed therein;

(c) at least one handle attached to said primary bag section for carrying the infant care bag by hand;

(d) at least one handle attached to said removable auxiliary bag section for carrying said removable auxiliary bag section by hand;

(e) two adjustable straps attached to said primary bag section for carrying the infant care bag upon the user's back;

(f) a shoulder strap detachably attached to said primary bag section for carrying the infant care bag over the shoulder;

(g) a seat rotatably attached to said primary bag section;

(h) said primary bag section forming a backrest;

(i) wherein one of the closable compartments of said primary bag is a cooler compartment;

(j) a shelf and a flexible insulating curtain formed as a removable unit disposable within the cooler compartment, said shelf having a cavity formed therein.

5,062,558
FOOD TRAY AND BIB SYSTEM

Michael A. Stang, 26 Stockmill Rd., Apt. F, Pikesville, Md. 21208

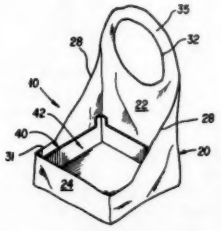
Continuation-in-part of Ser. No. 246,678, Sep. 20, 1988, Pat. No. 4,946,094. This application May 7, 1990, Ser. No. 519,475
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—270 **16 Claims**

1. A food tray bib system adapted to be removably coupled to the body of a user, comprising:

a flexibly collapsible housing integrally formed in one piece formation and defining a deformable cavity;

bib means for overlaying a first portion of a user's body and providing a removable coupling to a second portion of said user's body, said bib means defining a rear wall of said housing extending longitudinally a predetermined distance external said cavity, said flexibly collapsible housing including an opposing pair of side walls, each of said side walls having an angularly extended portion extending between a forward perimeter portion of said cavity and an upper portion of said bib means; and,

tray means insertable within said deformable cavity for supporting food items disposed thereon, said tray means including a container housing having a predetermined contour and defining an internal housing chamber having a planar bottom member for supporting said food items, said container housing within said deformable cavity, whereby subsequent to receipt of said container housing

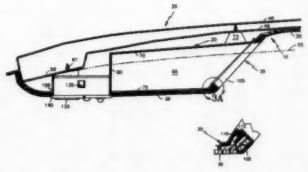


said deformable cavity substantially conforms to said contour of said container housing, said container housing including a plurality of corner members, each of said corner members extending a predetermined distance external said internal housing chamber for interfacing with said pair of opposing side walls to provide a vertically extending support for said opposing side walls in said vertical direction and maintaining said opposing side walls in a substantially vertical plane.

5,062,559
OVERHEAD CONSOLE

Monte L. Falcoff, Southfield, Mich., assignor to United Technologies Automotive, Dearborn, Mich.

Filed Aug. 1, 1989, Ser. No. 388,269
Int. Cl.[5] B60R *7/04*
U.S. Cl. 224—311 **17 Claims**



1. An overhead center console for a motor vehicle or the like having a roof provided with a windshield header, the interior surface of said roof being covered by a headliner, said console including a compartment for the storage of objects therein and characterized by:

said compartment being attached to said windshield header from therebelow;

said compartment being disposed between said headliner and

said vehicle roof such that at least a portion of said compartment lies above the nominal surface of said headliner, said compartment being covered over the lower portion of the outer surface thereof by said headliner,

said compartment being provided with a first opening for access to the interior thereof,

said first compartment opening being adapted for registry with a first opening in said headliner; and

a bezel for providing a decorative covering for the registry of said first compartment opening with said first headliner opening.

5,062,560

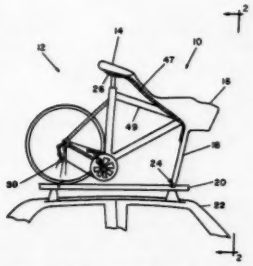
FLEXIBLE PROTECTIVE BICYCLE COVER FOR TRANSPORT ON A VEHICLE CARRIER

Kent J. Wasden, 3680 North 250 East, Rexburg, Id. 83440

Filed Oct. 11, 1989, Ser. No. 420,013

Int. Cl.[5] B60R *9/10*

U.S. Cl. 224—328 **5 Claims**



1. An elastic continuous protective cover for a bicycle being transported by a vehicle, said bicycle having front forks, handlebars, a seat, and a front wheel removed, the cover comprising:

a. a depending front fork cover portion having means for attaching said cover portion to the front fork at the end thereof;

b. a handle bar cover portion continuously connected to the front fork cover portion;

c. a seat cover portion continuously connected to the handle bar cover portion and including a pocket for fitting over the seat;

d. a connecting fabric portion continuously connecting the handle bar cover portion and the seat cover portion and having a small cross-wind profile;

e. each of the front fork cover portion and the handle bar cover portion being expandable to elastically surround the handle bars and front fork of the bicycle; and

f. elastic attachment means formed continuously from one side of said handle bar cover portion around said seat cover portion to an opposite side of said handle bar cover portion, whereby the flexible cover protects the forks, handle bars, and seat of the bicycle, while providing a small cross-wind profile.

5,062,561

APPARATUS FOR CONTROLLING THE FEED OF AN INTERMITTENT WEB-FEEDING APPARATUS

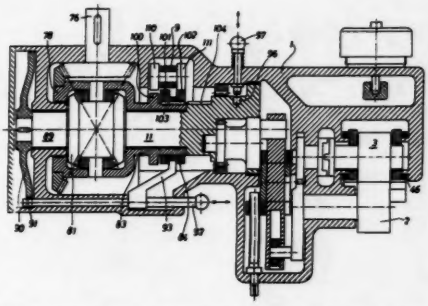
Helmut Messner, Arbon, Switzerland, assignor to Bruderer Ag, Frasnacht, Switzerland

Filed Apr. 20, 1990, Ser. No. 512,749

Int. Cl.[5] B65H *20/00*

U.S. Cl. 226—152 **7 Claims**

1. In an apparatus for controlling the feed of a feeding apparatus for intermittently feeding a web-shaped workpiece, the apparatus having a rotationally driven web with a sleeve section, a planetary gear having planet gears pinioned on the web and sun wheels, a drive shaft rotatably supported in the sleeve section of the web and coupled for rotation with one of the sun wheels, feeding means having a pressing and feeding roller rotated by the rotation of the drive shaft and rockable for intermittently feeding the web-shaped workpiece when rocked into engagement therewith, holding means having a pressing bar rockable into intermittent engagement with the web-shaped workpiece for holding it, and rocking means operated by the rotation of the drive shaft for rocking the feeding and



holding means, the improvement of the rocking means, comprising:

a plurality of control disks on a shifting sleeve arranged rotationally fixed but axially displaceable on the sleeve section of the web and a further control disk fixedly mounted to the sleeve section of the web to control the rocking means for the feeding and holding means.

5,062,562

PORTABLE POWER FASTENING TOOL

James V. Michael, Hayward, Calif., assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Jul. 14, 1989, Ser. No. 379,819

Int. Cl.[5] B25C *1/04*

U.S. Cl. 227—111 **10 Claims**

1. A pneumatic tool for selectively driving fasteners into a surface of a floor and compressively striking the surface, comprising:

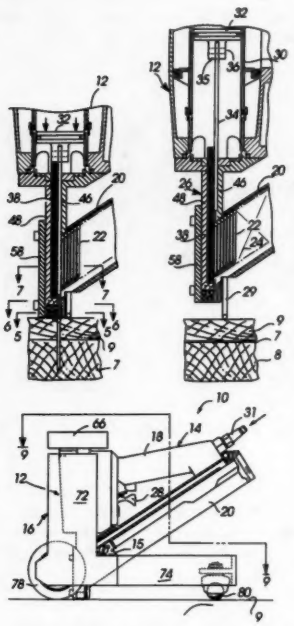
a barrel assembly located at an end of the tool having a bore therein comprising a longitudinal first groove slidably capturing a driver member and a longitudinal second groove capturing a hammer member in sliding contact with the driver member, one of hammer member and the driver member having a third longitudinal groove therein for slidably capturing the other member, thereby allowing independent sliding movement of the members along the bore in a first driving direction toward one end of the bore and a second, opposite, retraction direction;

an air motor mounted to the barrel assembly and including a reciprocable piston means operatively connected to the drive member for moving the drive member in the first and second directions;

the piston means being adopted for pushing the hammer member in the first, driving direction;

a fastener magazine secured to the barrel assembly and adopted for serially supplying fasteners via a slot in the barrel assembly into the barrel assembly to a position coincident with the path of the driver member, whereby driving movement of the piston means impels the driver member to drive a fastener through the one end of the bore and the hammer member to compressively strike the surface of the floor through said one end of the bore; and

the tool further comprising a carriage mounted thereto which includes a frame for supporting the tool and wheel



means mounted thereon for moving the carriage along the floor from one fastening location to another.

5,062,563

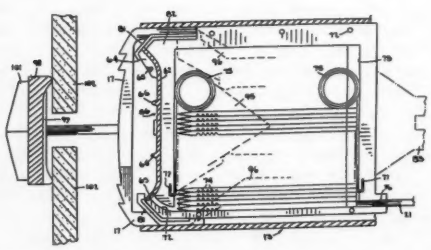
FASCIA STAPLER

David T. Green, Westport, Conn.; Wayne P. Young, Brewster, N.Y.; Henry Bolanos, East Norwalk, Conn.; Robert J. Geiste, Milford, Conn.; Keith Ratcliff, Sandy Hook, Conn., and Daniel E. Alesi, New Fairfield, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Apr. 10, 1989, Ser. No. 335,822

Int. Cl.[5] A61B *17/00*

U.S. Cl. 227—176 **42 Claims**



1. In a stapler, the combination comprising

a housing;

a pusher assembly movably mounted in said housing between a rest position and a fired position;

a handle articulated to said housing and said pusher assembly for reciprocating said pusher assembly between said positions;

a toothed rack secured to and within said housing;

a pawl mounted on said pusher assembly and having a depending tab for selectively engaging said rack during movement of said pusher assembly from said rest position toward said firing position;

a counter wheel rotatably mounted about said pusher assembly and having a plurality of inwardly directed tabs and a sequence of numbers thereon, and a lever mounted on said pusher assembly for selectively engaging one of said tabs to rotate said wheel in response to movement of said pusher assembly through said wheel.

5,062,564

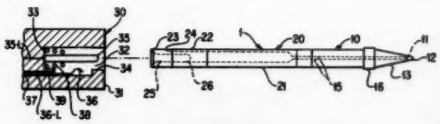
RAPID RESPONSE SOLDERING STATION

Paul L. Urban, Cheraw, S.C., assignor to Cooper Industries, Houston, Tex.

Filed Nov. 28, 1989, Ser. No. 442,219

Int. Cl.[5] B23K *3/03*; H05B *1/02*

U.S. Cl. 228—9 **36 Claims**



1. A soldering tip for conducting heat from a heat source external to said soldering tip to an application site, comprising:

a heat receiving end including means for coupling the soldering tip to an external heat source;

a heat emitting end forming a working surface for contacting an application site and conducting heat thereto; and

a sensor for sensing local temperature embedded within the soldering tip immediately adjacent said working surface.

5,062,565

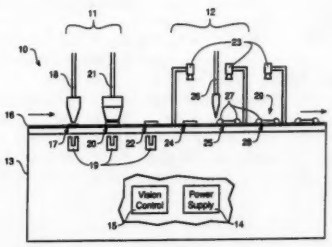
METHOD FOR COMBINING DIE ATTACH AND WIREBOND IN THE ASSEMBLY OF A SEMICONDUCTOR PACKAGE

Alan G. Wood, Boise; Warren M. Farnworth, Nampa, and George P. McGill, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 13, 1990, Ser. No. 553,099

Int. Cl.[5] B23K *3/08*

U.S. Cl. 228—9 **2 Claims**



1. A unified and automatically controlled semiconductor device assembly and inspection system, said system comprising:

a) An existing automated leadframe die attach equipment and automated wire bonder operably attached to each other in such a way as to unify and coordinate mechanical and electrical operations between said die attach equipment and said wire bonder during assembly of semiconductor devices;

b) a common lead frame transport means of known design operably and fixedly attached to and between said die attach equipment and said wire bonder in such a way as to support and move said semiconductor devices in a con-

trolled and continuous manner and serving to provide common reference for positional placement of said devices throughout said die attach and wirebond operations and final inspection of said completed devices;

c) a common lead frame position indexing means of known design operably attachable to said common lead frame transport means in a known manner to enable precise and accurate positioning and placement of said semiconductor devices during their assembly and inspection;

d) an automated vision control means operably and independently attachable to said die attach equipment in such a manner as to observe and control said die attach operation;

e) an automated vision control means operably and independently attached to said wire bonder in such a manner as to observe and control said wire bond operation and validate said previous die attach operation;

f) automated vision control means operably and independently attached to said assembly system in such a manner as to observe and control completely assembled semiconductor devices; and

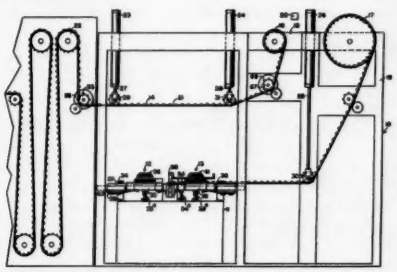
g) all of said automated vision control means operably interconnected to each other in such a manner as simultaneously to collect, store, coordinate and utilize all information received by each of said vision control means in order to validate all assembly operations and control, precisely and accurately, the assembly of said semiconductor devices.

5,062,566

AUTOMATED CARRIER-STRIP SPLICER

Sigmund Ege, Oslo, Norway, Kloften & Kloften A/S, Oslo, Norway

Filed Sep. 21, 1990, Ser. No. 585,965
Int. Cl.[5] B23K *1/14, 3/00*
U.S. Cl. 228—102 **11 Claims**



1. An improved apparatus for splicing carrier strip which has a large plurality of elements projecting therefrom at regular intervals, said apparatus comprising:

at least one cutting blade for the strip,

grooved guide plates for the strip,

two guide bars aligned end-to-end and slidably fitting the grooves of the plates, the bars comprising means for engaging said strip,

downstream and upstream sets of upper and lower cooperating jaws, the lower of each of each of the sets of jaws comprising one of the plates,

supplies of continuous lengths of strip,

means directing the strip in a pathway to another location, my apparatus aligning and connecting a trailing end of one supply to the leading end of another supply, the improvement comprising:

(A) automatic means for changing the pathway to a position closely aligned above the downstream of the bars,

(B) automatic means for determining the proximity of the trailing end,

(C) means actuated by the sensing means, for pressing the strip from its pathway so as to engage the strip with the downstream bar,

(D) means for sensing the engagement of the strip to the downstream bar,

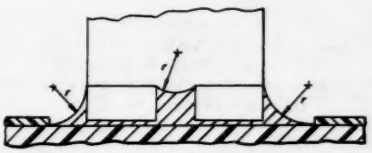
(E) automatic means, actuated by the engagement-sensing means, for cutting the trailing end of the strip, advancing solder across the trailing and leading ends, and fusing the solder to join together both supplies.

5,062,567

LEAD DESIGN TO FACILITATE POST-REFLOW SOLDER JOINT QUALITY INSPECTION

H. Keith Nishihara, Los Altos, Calif.; P. Anthony Crossley, Austin, Tex.; Neil D. Hunt, Mountain View, and J. Martin Tenenbaum, Portola Valley, both of Calif., assignors to Schlumberger Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 286,834, Dec. 20, 1988, abandoned.
This application May 1, 1990, Ser. No. 519,334
Int. Cl.[5] H05K *3/34*
U.S. Cl. 228—105 **5 Claims**



1. A method of inspecting solder joints in surface-mounted electronic components comprising:

placing an electrical component on a board said component having a plurality of leads;

soldering said leads to said board with solder material, thereby forming a peripheral fillet of solder around each lead periphery;

selecting a lead, a portion of said lead having a vertical hole therethrough of preselected diameter; and

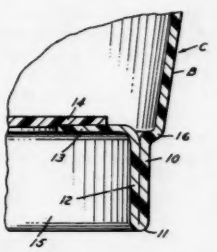
inspecting the quality of the peripheral fillet by observing the meniscus of said solder material through said hole.

5,062,568

THERMOPLASTIC CUP AND METHOD AND APPARATUS FOR MAKING

James A. Hill, Toledo, and John E. Burtch, Curtice, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Oct. 9, 1990, Ser. No. 594,533
Int. Cl.[5] B65D *3/12*
U.S. Cl. 229—1.5 B **7 Claims**



6. A cup-like container comprising

a side wall formed from a single double ended sheet of a heat-shrinkable thermoplastic foam material,

the ends of said sheet being joined to one another to form a seam,

said side wall extending inwardly and downwardly from a point near the open mouth of the upper end of the container to a point near the bottom, and

a recessed bottom on the bottom of said side wall comprising

an integral folded portion folded along its lower edge toward the mouth of the container to form a double wall portion having an inner wall and an outer wall, and a radially inwardly extending annular portion,

a separate bottom member overlying said radially inwardly extending portion,

said bottom member comprising a disk made of thermoplastic foam material,

said disk having a diameter less than the outer diameter of said radially inwardly extending portion,

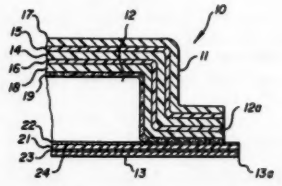
and being sealing joined without adhesives to said radially inwardly extending portion.

5,062,569

PEELABLY SEALED PLASTIC PACKAGES AND METHOD OF PREPARING SAME

Ihal M. Hekal, 121 Blackberry Dr., Stamford, Conn. 06903

Filed Aug. 1, 1988, Ser. No. 226,490
Int. Cl.[5] B65D *1/34*
U.S. Cl. 229—3.5 R **18 Claims**



1. A package comprised of a container formed from a structure having a sealing surface formed from a polypropylene resin, the container having a complementary lid, the lid having a contact face and extending across an opening in the container in contact with the sealing surface, the contact face of the lid and sealing surface being opposed and bonded together by an internally cleavable heat seal layer intermediate between the opposed lid contact face and sealing surface, the heat seal layer being comprised of about 30 to about 50 percent by weight of a particulate filler and an olefin polymer blend including about 20 to about 45 percent by weight of an olefin homopolymer about 20 to about 50 percent by weight of a highly crystalline propylene-ethylene block copolymer and about 1 to about 20 percent by weight of an elastomeric ethylene-propylene rubber.

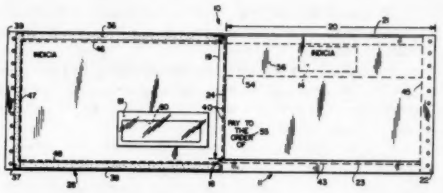
10. A method of making a package comprised of a container part heat sealed with a lid having a contact face, the container part having a contact face formed from a polypropylene resin, the contact face of the lid and container part being placed in opposed relation to be hermetically heat sealed together, which method comprises applying to at least one of the opposed faces a heat sealable layer in which the cohesive strength of the heat seal layer is less than the tensile strength of the heat seal layer so that the layer cleaves within itself when forces are applied to the parts to pull them apart, the heat seal layer being comprised of a mixture of about 30 to about 50 percent by weight of a particulate filler and an olefin polymer blend including a mixture of about 20 to about 45 percent by weight of an olefin homopolymer, about 20 to about 50 percent by weight of a highly crystalline propylene-ethylene block copolymer and about 1 to about 20 percent by weight of an elastomeric ethylene-propylene rubber.

5,062,570

MAILER WITH DIE CUT INSERT AND SELF-IMAGING AREA

Robert E. Ashby, Quakertown, Pa., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Nov. 19, 1990, Ser. No. 615,167
Int. Cl.[5] B65D *27/04, 27/34*
U.S. Cl. 229—71 **22 Claims**



1. A business form comprising:

a bottom ply having a first width and length, and having a self-contained, self-imaging spot formed on the top surface thereof, said spot covering only a small percentage of the area of the top surface;

an insert ply having a second width and length, both smaller than said first length and width;

a top ply having essentially said first width and length, and means for operatively connecting said top ply to said bottom ply along both lengthwise and widthwise edges thereof

means for attaching said insert ply to said bottom and top plies adjacent only a first lengthwise edge and along only a first widthwise edge, so that a second lengthwise and a second widthwise edge of said insert ply are free of connection to both said top and bottom plies; and

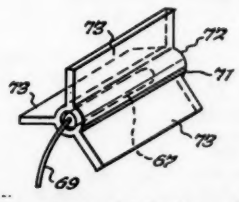
means defining perforations in said insert ply parallel to said first lengthwise and widthwise edges thereof, to allow detachment of a detachable portion of said insert ply from the first lengthwise and widthwise edges thereof.

5,062,571

TEMPERATURE SENSING CONTROL FOR REFRIGERATION SYSTEM

Raymond P. Arno, Amherst, and Scott C. Carnes, Buffalo, both of N.Y., assignors to Rayco Enterprises, Inc., Buffalo, N.Y.

Division of Ser. No. 652,309, Feb. 6, 1991, which is a continuation-in-part of Ser. No. 490,340, Mar. 8, 1990, abandoned. This application Mar. 1, 1991, Ser. No. 662,961
Int. Cl.[5] G01K *1/08*
U.S. Cl. 236—43 A **2 Claims**



1. In a fluid passing conduit having an internal surface through which fluid passes and having an external surface subject to the temperature of a cooling medium in which the fluid passing conduit is located, a temperature sensing control comprising a finned tube having a central tubular portion, fin means extending outwardly from said central tubular portion, outer edge means on said fin means in firm heat conducting contact with said internal surface, and a control member located within said central tubular portion and in firm heat conducting contact therewith to thereby substantially sense the

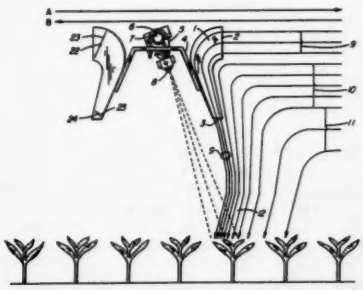
temperature of said fluid passing through said fluid passing conduit when said flow dominates the effect of said cooling medium to which the external surface of said fluid passing conduit is subjected and to substantially sense the temperature of said medium when the latter dominates the temperature of said fluid passing through said fluid passing conduit.

5,062,572

SPRAY SHIELD

Roger Reiter, Saskatoon; Stanley Boyko, and Nadina Boyko, both of St. Brieux, all of Canada, assignors to F. P. Bourgault Industries, Saskatchewan, Canada

Filed Jul. 17, 1990, Ser. No. 554,242
Claims priority, application Canada, Nov. 7, 1989, 2002372
Int. Cl.[5] B05B *1/28*
U.S. Cl. 239—899 **12 Claims**



1. A spray shield for use with an agricultural liquid sprayer of the type comprising at least one elongate wet spray boom adapted to spray when said boom is in the field position transverse to the direction of travel;

said spray shield comprising an elongate structure adapted to be positioned longitudinally adjacent said wet spray boom and having an air intake adapted to be directed horizontally away from said wet spray boom, and an air outlet adapted to be directed downwards and forwards of said spray boom;

said spray shield defining a passageway between said intake and said outlet such that during operation, air exiting through said outlet produces a downwardly directed curtain of air in front of the spray in the direction of travel thereby reducing the disruption of spray.

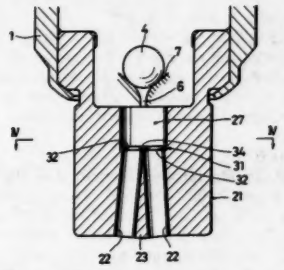
5,062,573

NOZZLE STRUCTURE IN ELECTROMAGNETIC FUEL INJECTOR

Toshiro Makimura, Obu, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Mar. 20, 1990, Ser. No. 496,317
Claims priority, application Japan, May 29, 1989, 1-135226
Int. Cl.[5] F02M *61/00*
U.S. Cl. 239—533.12 **3 Claims**

1. In an electromagnetic fuel injector including an injector body, a valve housing mounted in a front portion of said injector body, said valve housing having an injection hole at a front end thereof, a solenoid coil mounted in a rear portion of said injector body, a valve axially movably received in said valve housing, an armature fixed to a rear end portion of said valve, a spring for normally biasing said valve in a valve closing direction, and a nozzle mounted to the front end of said valve housing, said nozzle having a plurality of atomizer holes communicated with said injection hole of said valve housing, wherein said valve is reciprocated by a magnetic attraction force due to excitation of said solenoid coil and a reaction force of said spring to thereby intermittently inject fuel from said injection hole; the improvement comprising an atomizer plate provided between said nozzle and said injection hole, said atomizer plate having a plurality of atomizer apertures arranged at circumferentially equal intervals, parting portions for parting said atomizer apertures and a fuel colliding portion formed at a central junction area of said parting portions against which the fuel injected from said injection hole collides, wherein each of said atomizer apertures has a shape similar to that of each of said upstream openings of said atomizer holes, and has an opening area slightly smaller than that of each upstream opening of said atomizer holes.



5,062,574

PROCESS FOR THE PREPARATION OF ACTIVE-MASS OF IMPROVED QUALITY FROM ACTIVE-MASS WASTES FORMED DURING THE PRODUCTION OF LEAD ACCUMULATORS

József Kéri, Budapest, Hungary, assignor to Akkumulator-Es Szarazelemgyar, Budapest, Hungary

Filed Aug. 13, 1990, Ser. No. 567,067
Claims priority, application Hungary, Aug. 16, 1989, 4206/89
Int. Cl.[5] B02B *5/02*
U.S. Cl. 241—22 **2 Claims**

1. A process for the preparation of a positve or negative active mass of lead accumulators by using the active mass separated from production-refuse plates and/or the active-mass wastes formed during production, which process comprises:

a) drying the active mass waste,

b) heat-treating the dried active-mass waste at a temperature of 500° to 600° C.,

c) feeding the heat-treated active-mass waste together with metal lead in an amount of at most 80% by mass, based on the mass of the metal lead, into a lead-powder producing mill, wherein the starting active-mass is positive when positive active-mass is prepared and the starting active-mass waste is negative when negative active-mass is prepared.

5,062,575

COMMINUTOR WITH IMPACT, SHEAR AND SCREENING SECTIONS

Edward J. Barnabie, Turnersville, N.J., and John D. Duke, Jr., Collingdale, Pa., assignors to Pennsylvania Crusher Corporation, Broomall, Pa.

Continuation of Ser. No. 298,233, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 47,091, May 8, 1987, abandoned. This application Mar. 20, 1990, Ser. No. 495,975
Int. Cl.[5] B02C *13/282*
U.S. Cl. 241—73 **17 Claims**

1. Comminuting apparatus for comminuting by sequential action of impact and shearing members, said apparatus comprising:

A) a rotor mounted for rotation about an axis of rotation and comprising a shaft and hammers mounted in at least one circular array for rotation with said shaft, said hammers having peripheral surfaces or edges defining a hammer circle upon rotation of said shaft,

B) means for introducing feed particulates to the rotor

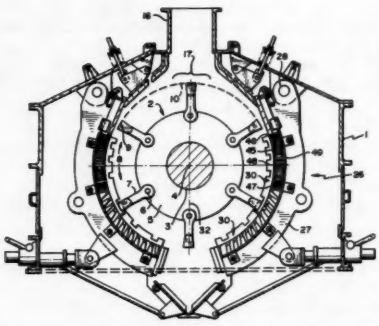
1) from outside the hammer circle,
2) with a component of motion directed radially inward with respect to the axis, and
3) at an in-feed position on the hammer circle,

C) an impact breaker member
1) located opposite a portion of the hammer circle adjacent the in-feed position and
2) having at least one surface extending in a direction of rotation of said rotor and convergent with the hammer circle for crowding feed particulates against the rotor,

D) a cage having a generally arcuate inner working face confronting and adjacent to the hammer circle and including
1) a cage frame, and
2) plural grinding members supported by the frame in at least one array for forming the working face,
a) said members being mounted and distributed in or on the frame in a generally arcuate pattern at least partially surrounding the hammer circle,
b) with the lengths of said members lying generally parallel to the axis,
c) with said members being angularly spaced from one another about said axis,

d) said members having inner surfaces confronting and adjacent to the hammer circle, and

e) at least a portion of said grinding members being at least one group of shearing members in angularly consecutive series within which



(1) the angular width of said shearing members is about one half inch or more,
(2) the angular spacing of said shearing members is about one eighth of an inch or more,
(3) the ratio of angular spacing to angular width of said shearing members is about 0.15 or more,
(4) the number of shearing members per peripheral inch of that portion of the working face occupied by the shearing members is at least one; and
(5) the angular interval of the hammer circle subtended by said group or groups of shearing members represents at least about 30 degrees, at least a portion of the arc subtended by the shearing members extending above the three o'clock position of the hammer circle,

for causing the major portion of feed particulates traversing the series of shearing members to skip over the inner surfaces of the shearing members, and

f) at least a portion of said grinding members being at least one group of screening members in angularly consecutive series within which
(1) the angular width of said screening members is about one inch or more,
(2) the angular spacing of said screening members is about three quarters of an inch or more,
(3) the ratio of angular spacing to angular width of said screening members is about 0.5 or more,
(4) the number of scanning members per peripheral inch of that portion of the working face occupied by the screening bars is less than one and
(5) the angular interval of the hammer circle subtended by said group or groups of screening members represents at least about 45 degrees,

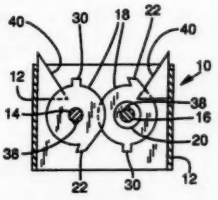
for causing the major portion of feed particulates traversing the series of screening members to exit the hammer circle via the spaces between the inner surfaces of the screening members.

5,062,576

ROTARY SHEAR-TYPE SHREDDER CUTTER WITH RECTANGULAR FEED TOOTH

Dan S. Burda, 7247 Lake Bluff Ct., Wilsonville, Oreg. 97070

Filed Jun. 11, 1990, Ser. No. 537,050
Int. Cl.[5] B02C *18/16*
U.S. Cl. 241—167 **11 Claims**



1. A rotary shear-type shredder comprising:
a housing having an inlet at the top and a discharge at the bottom thereof;
first and second parallel spaced cutter shafts mounted for rotation within said housing;
reversible drive means for counterrotating said cutter shafts;
a plurality of cutter discs and spacers fixedly stacked on each of said first and second cutter shafts, a spacer disposed between each said cutter disc so that opposing cutter discs can mesh in coacting relationship for shearing of material;
a hook fixedly mounted on the circumferential surface of said cutter disc, slanted toward the direction of rotation for grabbing and pulling material through said cutter discs; and
a rectangular block fixedly mounted on the circumferential surface of each said cutter disc at a position spaced angularly from said hook, said rectangular block having parallel front and back sides, each side forming a pair of opposite right-angle cutting edges to improve grabbing and shredding of difficult-to-grab flat material.

2. A rotary shear-type shredding apparatus according to claim 1 wherein each said block is angularly positioned so as to be opposed by a coacting hook on an opposing cutter disc on the parallel shaft.

3. A rotary shear-type shredding apparatus according to claim 2 wherein an equal number of blocks and hooks are mounted on each said cutter disc, each block on each said cutter disc angularly spaced about 180 degrees apart from a hook on the circumferential surface of said cutter disc.

5,062,577

AGITATOR MILL

Philipp Schmitt, Lampertheim, and Norbert Stehr, Grünstadt, both of Fed. Rep. of Germany, assignors to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

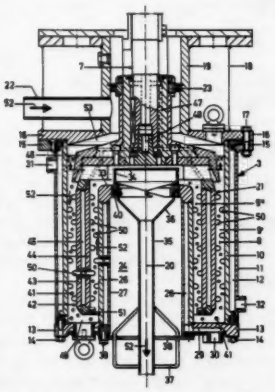
PCT No. PCT/EP88/00408, § 371 Date Nov. 6, 1989, § 102(e) Date Nov. 6, 1989, PCT Pub. No. WO88/09212, PCT Pub. Date Dec. 1, 1988

PCT Filed May 10, 1988, Ser. No. 439,048

Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716587

Int. Cl.[5] B02C *17/16*

U.S. Cl. 241—171 12 Claims



1. An agitator mill for the treatment of flowable grinding stock comprising a grinding receptacle (3) defining a mostly closed grinding chamber (9), an agitator element (21), capable of being rotatingly driven and being cup-shaped in relation to a common central-longitudinal axis (20), disposed in said receptacle, inside of which is disposed an interior stator (24) fixedly connected with the grinding receptacle (3), an exterior grinding chamber (9') being formed between the grinding receptacle (3) and an outer wall (43) of the agitator element (21) and an interior grinding chamber (9'') being formed between an inner wall (44) of the agitator element (21) and the interior stator (24), said interior grinding chamber being disposed coaxially within the exterior grinding chamber (9') and connected with it via a deflection chamber (49), the exterior grinding chamber (9'), the deflection chamber (49) and the interior grinding chamber (9'') forming the grinding chamber (9) which is partially filled with auxiliary grinding bodies (41), a grinding stock supply chamber (53), disposed ahead of the grinding chamber (9) in relation to the flow direction of the grinding stock, a separator device (34, 34') for the discharge of the grinding stock, disposed after the grinding chamber in relation to the flow direction of the grinding stock, said supply chamber and said separator device being disposed on the same side of the grinding receptacle, and bypasses (60, 60') for the return of the auxiliary grinding bodies (41) from the separator device (34, 34') to an area adjacent the grinding stock supply chamber (53) by utilizing centrifugal force being provided by the agitator element, wherein the exterior grinding chamber (9') and the interior grinding chamber (9'') are essentially annular cylindrical, in that the grinding stock supply chamber (53) is placed upstream of the exterior grinding chamber (9') in relation to the flow direction of the grinding stock and the separator device (34, 34') is placed after the interior grinding chamber in relation to the flow direction of the grinding stock and in that the bypasses (60, 60') are placed upstream of the separator device (34, 34') in relation to the flow direction of the grinding stock.

5,062,578

YARN WINDER

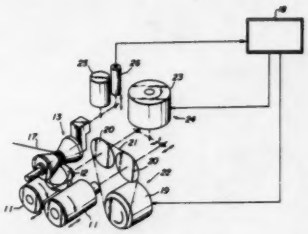
Masaaki Kaida, Higashiyamato, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 322,383, Mar. 13, 1989, abandoned. This application Sep. 6, 1990, Ser. No. 578,166

Claims priority, application Japan, Mar. 17, 1988, 63-62031

Int. Cl.[5] B65H *54/66;* A63B *45/00*

U.S. Cl. 242—3 8 Claims



1. A yarn winder for winding a yarn about a spherical body including a pair of cylindrical rollers extending in parallel with each other in a horizontal plane and rotatively driven in the same directions and reciprocatively driven in respective axial directions opposite to each other, and a two-frustoconical roller extending in parallel with the cylindrical rollers and urged by a predetermined force against the spherical body, wherein said the two-frustoconical roller comprises a center roller having a yarn guide and two taper rollers in the form of two frustocones separated from the center roller and rotatably arranged on both sides of the center roller so that smaller diameter ends of the frustocones are facing to the center roller and wherein a surface hardness of the cylindrical rollers is in the range of 40°–60° JIS A hardness and a surface hardness of said taper rollers is in the range of 80°–100° JIS A hardness.

5,062,579

REEL SHAFT IN MAGNETIC TAPE CASSETTE RECORDING AND/OR REPRODUCING

Yasuhiro Noguchi, Tokorozawa, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Continuation of Ser. No. 432,929, Nov. 7, 1989, abandoned. This application Jan. 10, 1991, Ser. No. 640,511

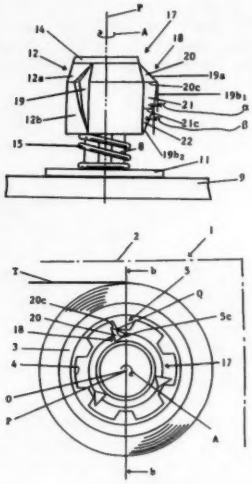
Claims priority, application Japan, Jul. 11, 1988, 63-145153[U]

Int. Cl.[5] B65H *75/22*

U.S. Cl. 242—68.3 3 Claims

1. A reel shaft for a magnetic tape recording and/or reproducing apparatus, which comprises a rotating body; and a plurality of vanes secured to an outer periphery of said rotating body for engagement with axially extending engaging members of substantially rectangular cross-sectional profile projecting inwardly from an inner wall of a reel hub around which a magnetic tape is wound in a tape cassette, said vanes each having a ridge on the side of the vane which comes into contact only at a single point with an engaging member of the reel hub while said rotating body is rotating, said ridge being formed on the contacting side of the vane by the intersection of converging surfaces on the vane such that the ridge thus defined lies in a plane generally perpendicular to the axis of rotation so that all ridges lie in the plane which coincides with the center line of the width of the magnetic tape in the tape cassette loaded into the apparatus and such that each ridge is

directed at an oblique angle to a radius of the rotating body and between said radius and a tangential position so that the vane



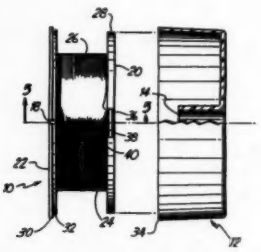
will make contact only at a single point with an engaging member of the reel hub.

5,062,580

SPOOL WITH RESILIENT TAB FOR STORING AND DISPENSING FILAMENTARY MATERIAL

Brian R. Meagher, Bloomington, Minn., assignor to Katun Corporation, Minneapolis, Minn.

Filed Feb. 28, 1991, Ser. No. 662,229
Int. Cl.[5] B65H *75/28*
U.S. Cl. 242—125.2 **14 Claims**



1. A spool for storing and dispensing a filamentary material, such as corona wire, the spool comprising:

a front ring;

a back ring having an outer edge and an inner surface facing the front ring;

a pocket extending radially inward from the outer edge and having an inner notch on the inner surface extending radially inward from the outer edge;

an outer hub around which the filamentary material is wound, connected coaxially between the back ring and the front ring; and

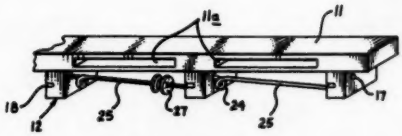
resilient tab means positioned securely within the pocket for capturing a loose end of the filamentary material between the resilient tab means and the back ring in a locked position and for releasing the loose en din a released position, the resilient tab means being deflectable from the locked position into the released position and tending to return to the locked position.

5,062,581

SPOOL SUPPORT APPARATUS

William R. Bakke, P.O. Box 9564, Virginia Beach, Va. 23450

Filed Sep. 18, 1990, Ser. No. 585,017
Int. Cl.[5] B65H *49/20*
U.S. Cl. 242—129.6 **6 Claims**



1. A spool support apparatus comprising,

an elongate support plate defined by a top surface and underlying bottom surface, and

a plurality of support blocks fixedly mounted to the bottom surface of the support plate, including at least a first support block and a second support block, and

at least one spring biased support arm including a rear terminal end and a forward terminal end, the rear terminal end mounted within the first support block, and the forward terminal end selectively receivable within the second support block, and

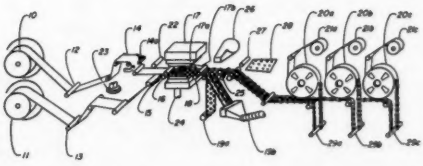
the first support block includes a forward wall spaced from and parallel a rear wall, and a top wall spaced from and parallel a bottom wall, and a forward side wall spaced from and parallel a rear side wall, and the rear terminal end of the spring biased support arm including an arm support shank, the arm support shank received within a through-extending support bore, the support bore orthogonally directed through the rear side wall and the forward side wall of the first support block adjacent the rear wall of the support block.

5,062,582

APPARATUS AND METHOD FOR PRODUCING SEMI-CONVERTED DISKETTE LINERS

Thomas D. Harmon, Woburn, and Kenneth G. Morrison, Hanover, both of Mass., assignors to International Paper Company, Purchase, N.Y.

Filed Aug. 2, 1989, Ser. No. 388,455
Int. Cl.[5] B65H *35/02, 35/04;* B26D *5/20*
U.S. Cl. 242—56.4 **15 Claims**



1. An apparatus for manufacturing cut products in continuous roll form, comprising:

a first unwind feed for supplying a continuous web of material from which the products are to be made along a machine direction;

a second unwind feed for supplying a transport web for supporting the continuous web of product material thereon in parallel therewith along the machine direction;

an input pair of feed rollers for incrementally advancing the two webs together to a cutting station;

a first input dancer bar positioned between the first unwind feed and the input feed rollers around which the product

web is run with a given take-up length such that the product web is unwound from the first unwind feed and fed by the input feed rollers to the cutting station under substantially constant tension, and a second input dancer bar positioned between the second unwind feed and the input feed rollers around which the transport web is run with a given take-up length such that the transport web is unwound from the second unwind feed and fed by the input feed rollers to the cutting station under substantially constant tension;

the cutting station having a die cutter for cutting through the product and transport webs to form cut product units in successive increments and respective connecting portions between increments for keeping the products units joined together in a continuous strip;

scrap removal means for separating the transport web and scrap material of the continuous web of product material from the strip of cut products;

an output pair of feed rollers positioned at an output end of the cutting station and indexed with the input feed rollers for incrementally transporting the strip of cut products to a windup station;

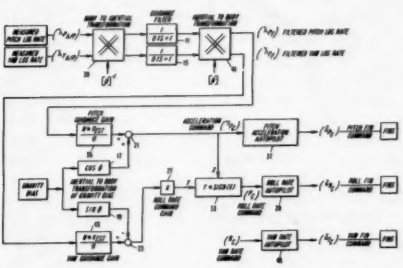
the windup station having a spool on which the cut product strip is wound as an output product roll; and

an output dancer bar positioned between the output feed rollers and the windup station around which the cut product strip is run with a given take-up length such that the cut product strip is fed by the output feed rollers from the cutting station and wound up on the windup spool under substantially constant tension.

5,062,583
HIGH ACCURACY BANK-TO-TURN AUTOPILOT

Gary D. Lipps, and Stephen D. Wood, both of Orlando, Fla., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Feb. 16, 1990, Ser. No. 480,976
Int. Cl.[5] F41G *7/20*; G06F *15/50*
U.S. Cl. 244—3.15 **13 Claims**



13. A bank-to-turn guided weapon, comprising

a pitch control surface for changing a pitch attitude of said guided weapon;

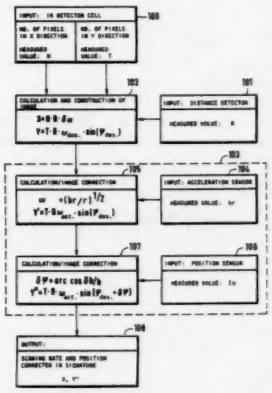
a roll control surface for changing a roll attitude of said guided weapon; and

a bank-to-turn autopilot for changing a yaw attitude of said guided weapon through a combination of changes in said pitch attitude and said roll attitude, said bank-to-turn autopilot comprising yaw rate determining means and pitch rate determining means and a roll command channel, said yaw rate determining means commanding said roll command channel exclusive of any contribution in magnitude from said pitch determining means.

5,062,584
TARGET DETECTION METHOD FOR FLYING BODIES PROVIDED WITH SEARCH HEAD

Franz H. Neff, and Jürgen Heinrich, both of Hermannsburg, Fed. Rep. of Germany, assignors to TZN Forschungs, und Entwicklungszentrum Unterlüss GmbH, Unterlüss, Fed. Rep. of Germany

Filed Sep. 8, 1989, Ser. No. 404,909
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 3835883
Int. Cl.[5] F41G *7/22*
U.S. Cl. 244—3.15 **10 Claims**



1. In a target detection method for a flying body provided with a search head and with the flying body rotating about an axis of rotation during its descending flight and scanning the area with its search head for possible targets, said method including the steps of determining the geometric dimensions of detected possible targets in the direction of the scanning path (Y direction) and in a direction perpendicular to the scanning path (X direction) under consideration of the distance R between the flying body and the possible target, and comparing the determined geometrical dimension values with corresponding stored values to detect the presence of a true target; the improvement comprising: continuously determining the actual angular velocity $\omega_{act.}$ of the flying body about the axis of rotation during the scanning process by (a) measuring the radial acceleration (br) of the flying body by means of an acceleration sensor mounted on the flying body so that it is radially displaced from the axis of rotation, and calculating $\omega_{act.}$ from the equation

$$\omega_{act.} = (br/r)^{\frac{1}{2}}$$

where r is the distance between the axis of rotation and the location of the acceleration sensor; and

using the determined angular velocity value $\omega_{act.}$ to correct the geometric dimension in the Y direction of the possible target during said step of determining the geometric dimensions.

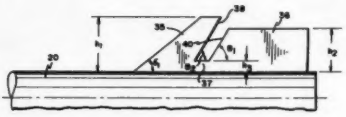
5,062,585
DETACHED AND ATTACHED THERMAL SPOILERS FOR KINETIC ENERGY PROJECTILE FINS

Ameer G. Mikhail, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 26, 1990, Ser. No. 543,896
Int. Cl.[5] B64C *3/28*
U.S. Cl. 244—3.24 **6 Claims**

1. A supersonic kinetic energy projectile intended to be

launched toward a selected target, comprising a projectile body, a plurality of fins attached to the projectile body to provide stability thereto in flight, spoilers means attached to the projectile body ahead of each of said fins for reducing the temperature of the fins during flight of the projectile, and thereby, the turning of the fins in flight, and wherein said fins being main fins, and said spoiler means comprising a plurality



of advance fins, each being associated with and being mounted ahead of a respective one of said main fins, and a predetermined gap between each of said advance fins and the associated trailing one of said main fins, and wherein each of said advance fins and the associated trailing one of said main fins are formed from a single sheet of material, and are connected by a portion of said material beneath said gap.

5,062,586

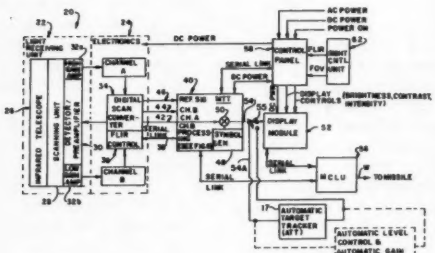
MISSILE TRACKING, GUIDANCE AND CONTROL APPARATUS

Gregory L. Hobson, St. Peters; Kent Luetkemeyer, Maryland Heights, and John R. Wootton, St. Louis, all of Mo., assignors to Electronics & Space Corporation, St. Louis, Mo.

Filed May 17, 1990, Ser. No. 524,495

Int. Cl.[5] F41G *7/26*

U.S. Cl. 244—3.12 **29 Claims**



1. Apparatus for acquiring, tracking and guiding an object to a target comprising:

beacon means carried on the object for providing an indication of its location at any time during its movement toward the target;

acquisition means responsive to the beacon means for acquiring and tracking the object, the acquisition means including means for scanning a field of view which includes an image of the object as produced by the beacon means, and means for converting the image from each scan into two separate electrical signals one of which is supplied as an output non a first signal channel and the other of which is supplied as an output on a second and separate signal channel;

first processing means for processing the electrical signal on the first signal channel to generate a display signal for producing a visual display of the field of view including the target and the object, and display means to which the display signal is supplied for producing the visual display;

second processing means for separately processing the electrical signal on the second signal channel to determine the location of the object relative to the target; and,

control means responsive to the location for generating and transmitting a control signal to the object to guide it to the target.

5,062,587

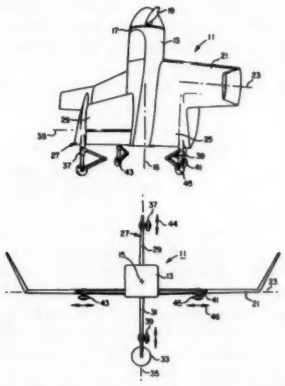
LANDING GEAR FOR A TAIL SITTING AIRPLANE

Kenneth G. Wernicke, 409 Circleview North, Hurst, Tex. 76054

Filed Jul. 27, 1990, Ser. No. 558,602

Int. Cl.[5] B64C *29/02*

U.S. Cl. 244—7 B **8 Claims**



1. In a tail sitter aircraft of a type having a fuselage with a longitudinal fuselage axis, a nose on its forward end and a tail section on its rearward end, a pair of wings extending laterally from the fuselage axis, a propulsion means for propelling the aircraft, the aircraft being capable of landing and taking off on the tail section with the nose up, an improved landing gear means, comprising in combination:

two pairs of landing gears, each landing gear having a wheel rotatably mounted about a wheel axle, each wheel carried by the aircraft and extending rearward of the tail section along a support axis which is offset from the fuselage axis and which intersects the wheel axle at a 90 degree angle, the landing gears within each pair being spaced opposite from each other relative to the fuselage axis, each landing gear within each pair being angularly spaced from an adjacent landing gear in the other pair relative to the fuselage axis; and

means for preventing each wheel of the landing gears from turning about its support axis so that each wheel will roll only along a straight line, and for aligning the wheels of each pair so that the wheels of each pair will roll only along the same straight line, the straight line of one pair intersecting the straight line of the other pair, to reduce the tendency of the aircraft to tip over when landing and for preventing the aircraft from moving translationally when resting on all of the landing gears.

5,062,588

SEGMENTED ROTATABLE NOZZLES

Douglas Garland, Rexdale, Canada, assignor to Boeing of Canada Ltd., Downsview, Canada

Filed Feb. 8, 1989, Ser. No. 307,449

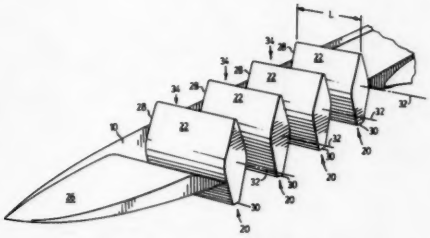
Int. Cl.[5] B64C *29/00*

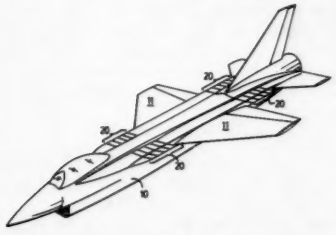
U.S. Cl. 244—23 D **20 Claims**

1. A thrust deflector arrangement for use in VSTOL aircraft having a pressurized gas generator fluidly communicating with a horizontal thrust outlets through a passage, said thrust deflector arrangement comprising:

a plurality of adjacent nozzles mounted in an aerodynamic element having upper and lower surfaces, each of said nozzles having;

a unitary body with a first face and second face,
an inlet for receiving pressurized gas from said passage,
and at least one outlet fluidly connected with said inlet for discharging said pressurized gas;
each of said nozzles being rotatable about an axis from a first position in which said outlet is directed generally downwardly, to a second position where said outlet is directed generally rearwardly;





in said first position said first and second faces of said bodies of adjacent nozzles are spaced apart thereby defining an air entrainment channel therebetween, said air entrainment channel being generally unobstructed above and below said nozzles;
in said second position said first and second faces of said adjacent nozzles contact thereby closing said air entrainment channel and forming continuous upper and lower surfaces which are least adjacent the upper and lower surfaces respectively of the aerodynamic element.

5,062,589

FIBER REINFORCED PRESSURE BULKHEAD WITH INTEGRATED FRAME

Siegfried Roth, Mittelstenweiler; Detlef Benz, Immenstaad; Anton Reichle, Stetten; Reiner Teske, Markdorf; Peter Zimmermann; Peter Hager, both of Friedrichshafen; Josef Mueller, Markdorf, and Werner Poenitzsch, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Dornier Luftfahrt GmbH, Oberpfaffenhofen, Fed. Rep. of Germany

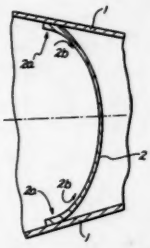
Filed Feb. 27, 1990, Ser. No. 485,949

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906170; Jul. 19, 1989, 3923871

Int. Cl.[5] B64C *1/10*

U.S. Cl. 244—117 R **19 Claims**

1. Pressure loaded aircraft bulkhead element, internal aircraft partition element or end element in an aircraft and for utilization in a pressurized environment: the element being made of fiber reinforced material and being of a calotte contour with a center part and a transition of round, oval or elliptical configuration at or near an edge portion; and



the edge portion including additional carbon fiber reinforcing layer means.

5,062,590

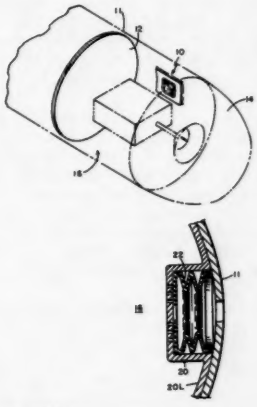
VENTING AND SEALING MECHANISM

James J. DiPrima, Medford, and Frank K. Porter, Jr., Billerica, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 6, 1989, Ser. No. 446,738

Int. Cl.[5] B64D *11/00*

U.S. Cl. 244—118.5 **5 Claims**



1. A missile comprising:
(a) a shell having a space enclosed thereby normally isolated from air surrounding the missile;
(b) a guidance apparatus disposed within the space; and
(c) venting and sealing mechanism disposed between the space and the atmosphere, the venting and sealing mechanism comprising:
(i) a cup fabricated from a metallic material, the cup having a lip affixed to an inner surface of the shell to encompass an opening formed through the shell and having a perforate bottom with individual holes adjacent to the space within the missile wherein the individual holes in the perforate bottom of the cup have transverse dimensions to render the perforate bottom opaque to radio frequency energy utilized by the guidance system;
(ii) a plug, fabricated from an elastometer and movably mounted within the cup, the plug having an annular end adapted to cover the individual holes in the perforate bottom; and
(iii) a bellows having a first end and a second end, the first end of the bellows affixed to the plug and the second

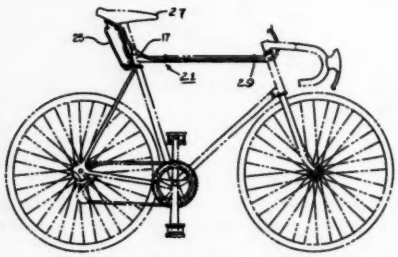
end of the bellows disposed adjacent the inner surface of the shell within the lip of the cup.

5,062,591

PRESSURIZED POTABLE BEVERAGE DRINKING SYSTEM

Kevin D. Runkel, Midkiff, Tex., assignor to Bikestream, Inc., Midland, Tex.

Filed Feb. 12, 1990, Ser. No. 478,919
Int. Cl.[5] B62J *11/00*
U.S. Cl. 224—148 **4 Claims**



1. A drinking apparatus for a bicycle comprising:
a. an inflatable bladder means adapted to receive a potable beverage under pressure and to expand in proportion to the volume of fluid so as to provide an expelling force for said potable beverage and force said potable beverage to a drinker riding the bicycle when a flow path is established;
b. a drinking tube for drinking therefrom by said rider; said drinking tube adapted to extend upwardly from the frame of the bicycle toward said drinker and having a free drinking end;
c. conduit means connected from said inflatable bladder means to said drinking tube and adapted for conveying said potable beverage to said drinking tube;
d. a valve means interposed intermediate said inflatable bladder means and said free drinking end of said drinking tube; said valve means being operable by said drinker to be opened to afford a drink as needed by said drinker; and
e. tie means for tying said conduit means to said frame of the bicycle for supporting and conveying said potable beverage to said drinker;
whereby a bicycle rider can drink a potable beverage without stopping the bicycle.

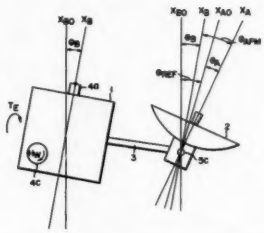
5,062,592

ORIENTATION CONTROL APPARATUS FOR SPACE VEHICLE

Hitoshi Kishimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 11, 1990, Ser. No. 507,467
Claims priority, application Japan, Apr. 14, 1989, 1-94879
Int. Cl.[5] B64G *1/24*
U.S. Cl. 244—164 **5 Claims**

1. An orientation control apparatus for a space vehicle, comprising:
a first orientation control system for controlling the orientation of a main body of the space vehicle on the basis of information representing a variation in the orientation of the main body;
a second orientation control system for controlling the orientation of a device provided on the main body on the basis of information representing a variation in the orientation of the device;
a first estimation section for estimating a target direction of the device;
a second estimation section for estimating an orientation error of the device on the basis of information representing the target direction estimated by the first estimation section and on the basis of information obtained by the first orientation control system and representing a variation in the orientation of the main body;
a first compensation means for correcting the operation of the second orientation control system on the basis of the orientation error estimated by the second estimation section, thereby compensating for dynamic effects which the first orientation control system may have on the second orientation control system; and



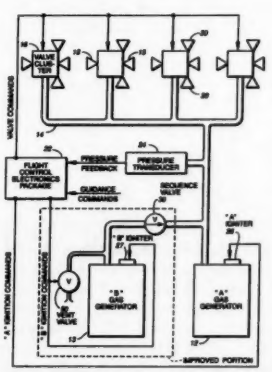
a second compensation means for correcting the operation of the first orientation control system on the basis of the estimated orientation error, thereby compensating for dynamic effects which the second orientation control system may have on the first orientation control system when the first compensation means performs compensation.

5,062,593

SOLID-PROPELLANT-POWERED MANEUVERING SYSTEM FOR SPACECRAFT

Charles W. Goddard, San Jose; John T. Lucas, Los Altos, and Paul A. Galvan, San Jose, all of Calif., assignors to United States Government as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 15, 1991, Ser. No. 660,361
Int. Cl.[5] B64G *1/26*; F42B *15/033*
U.S. Cl. 244—169 **4 Claims**



1. In combination with a solid-propellant-powered maneuvering system for spacecraft having (1) a first gas generator set for providing a hot gas output said first set consisting of at least one gas generator each generator containing solid propellant and having an ignition means responsive to an ignition command, the burn rate of said propellant being directly related to the pressure of said gas output so that the rate of said gas output is directly related to the pressure of said gas output, (2) at least three nozzle valve clusters disposed to be mounted on the spacecraft and radiosymmetrically arranged about the

spacecraft roll axis, each nozzle valve cluster having a first and a second high thrust nozzle valve having a corresponding first and second high thrust nozzle attached and fluidly connected thereto the first high thrust nozzle oriented to produce thrust in a direction along and defining a high-thrust-line axis and the second high thrust nozzle oriented to produce thrust in a direction directly opposite to that of the first high thrust nozzle and along said high-thrust-line axis which is spaced from and is parallel to said roll axis, and each nozzle valve cluster also having a first and a second low thrust nozzle valve having a corresponding first and second low thrust nozzle attached and fluidly connected thereto the first low thrust nozzle oriented to produce thrust in a direction along and defining a low-thrust-line axis and the second low thrust nozzle oriented to produce thrust in a direction directly opposite to that of the first low thrust nozzle and along said low-thrust-line axis which intersects said high-thrust-line axis and is perpendicular to a plane containing both said high-thrust-line axis and said roll axis, each nozzle valve having means for individually operating in response to valve commands, (3) a gas conducting manifold fluidly connecting each gas generator of said first gas generator set to each nozzle valve cluster inlet port, (4) a gas pressure transducer fluidly connected to said manifold, and (5) command generating means responsive to guidance command inputs and responsive to pressure feedback from said gas pressure transducer for generating valve commands to individual nozzle valves and for generating ignition commands to individual gas generator ignitors, the improvement which comprises:

a second gas generator set for providing a hot gas output said second set consisting of at least one gas generator each generator containing solid propellant and having an ignition means responsive to an ignition command, the burn rate of said propellant being directly related to the pressure of said gas output so that the rate of said gas output is directly related to the pressure of said gas output; and

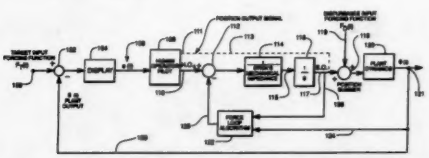
a set of sequence valves equal in number to the number of gas generators of the second gas generator set, each sequence valve uniquely associated with a particular gas generator of said second set and fluidly connecting that associated gas generator to the gas conducting manifold, each sequence valve installed in a direction to permit gas flow from the associated gas generator into said manifold.

5,062,594

FLIGHT CONTROL SYSTEM WITH TACTILE FEEDBACK

Daniel W. Repperger, Vandalia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 29, 1990, Ser. No. 624,096
Int. Cl.[5] G05D *01/00*; B64C *13/46*
U.S. Cl. 244—175 **9 Claims**



1. An aircraft flight controller system providing a human operator with visual primary flight control information and tactile secondary flight control information supplementary to the visual primary flight control comprising the combination of:

a primary information human operator vision based and noise input forcing function $f_D(t)$ signal inclusive closed feedback loop aircraft dynamics plant controlling apparatus, said apparatus including,

an aircraft dynamics plant means output, $\theta(t)$ signal, to target input forcing function, $F_T(t)$ signal, difference error based visual display having plant position display e(t) signal, output to said human operator,

a human operator force and secondary information tactile feedback force operated control stick including a predetermined stick mechanical impedance characteristic and integration means for converting stick velocity signals to stick position signals, and

aircraft dynamics plant for generating said output $\theta(t)$ signal, said aircraft dynamics plant means including said $F_D(t)$ noise forcing signal as an input thereto;

a secondary information tactile signal feedback path having said aircraft dynamics plant means output $\theta(t)$ signal and said control stick position output signal as inputs thereto, and

a secondary information force signal output connected with said control stick, and

a transfer function defined by the mathematical relationship

$$1/P^N\,(1/P - s.S\ IMP)$$

wherein

P represents the aircraft dynamics plant transfer function

N represents a feedback determination variable having possible values of zero and one,

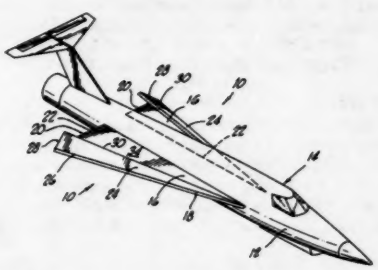
s represents the Laplace transform operator, and S IMP represents the impedance of said control stick.

5,062,595

DELTA WING WITH LIFT ENHANCING FLAP

Tony Maxworthy, Culver City, Calif., assignor to University of Southern California, Los Angeles, Calif.

Continuation of Ser. No. 515,312, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 221,320, Jul. 19, 1988, abandoned. This application Jan. 2, 1991, Ser. No. 635,800
Int. Cl.[5] B64C *3/50*
U.S. Cl. 244—214 **23 Claims**



1. A wing assembly, comprising:

a delta wing having a leading edge, a trailing edge and side edge;

a delta flap smaller in size than the wing having a leading edge, a trailing edge and a side edge;

means for rotatably connecting the entire leading edge of the flap to the leading edge of the wing; and

rotating means for rotating the flap with respect to the top surface of the wing under flow conditions to create stable vortices with high circulation over substantially the entire wing and to thereby enhance wing lift.

5,062,596

CONTROL APPARATUS

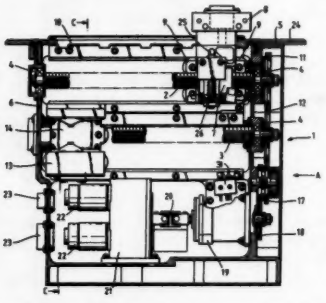
Alan Aldersley, Blackpool, and Ronald Hayes, Preston, both of England, assignors to British Aerospace plc, London, England

Filed Aug. 8, 1990, Ser. No. 564,069

Claims priority, application United Kingdom, Aug. 26, 1989, 8919453

Int. Cl.[5] B64C *13/28*

U.S. Cl. 244—234 5 Claims



1. Control apparatus comprising a control member linearly moveable on a first shaft, and means for detecting the position of said control member on said first shaft and generating an output control signal in response thereto, further a second shaft parallel to said first shaft and having linearly movable thereon a counterweight said shafts being coupled and driven together such that movement of said control member causes said counterweight to move with, but in the opposite direction to, said control member wherein the control member and the counterweight are both threadably mounted on their respective shafts through ball screws and said shafts are able to rotate in synchronism, but in opposite senses by gearing associated with said shafts.

5,062,597

METHOD OF FORMING A NEW PILE AFTER DISCHARGE OF A COMPLETED PILE IN A PILE-FORMING MACHINE ASSOCIATED IN PARTICULAR WITH A PRINTER AND DEVICE FOR CARRYING OUT THIS METHOD

Martial G. E. Martin, Villejuif, France, and Pierre L. V. Nuttin, Massagno, Switzerland, assignors to Syntone, Belgium

Filed Mar. 16, 1990, Ser. No. 494,777

Claims priority, application France, Mar. 17, 1989, 89 03560

Int. Cl.[5] B41L *1/32*

U.S. Cl. 270—39 9 Claims

1. A method for forming individual zigzag folded piles from an endless web made from a flexible material such as paper and containing flaps defined by transverse perforation lines, in a pile forming machine comprising a pile support table and, above said table, a web guiding swinging unit making a pivoting movement above said table, said method comprising the steps of

continuously feeding said endless web to said swinging unit and causing said unit to deposit the continuously forward-moving web on said table in a zigzag folded file configuration,

rupturing the web along a transverse perforation line between the last flap of the folded pile and the first flap of a new pile to be formed,

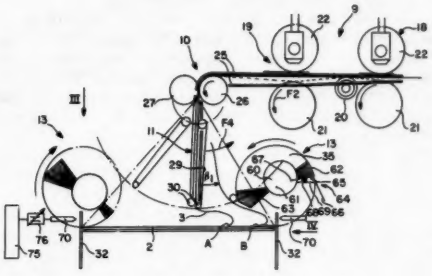
continuing the forward motion of the ruptured web until the last flap has been laid down on the folded pile and a forward end of the first flap reaches a position corresponding to its final position at the base of the new pile to be formed,

stopping the swinging device and the forward motion of the web,

moving said support table away from a pile-forming position to a distant pile discharge position,

providing a cushion of gaseous fluid such as air under pressure in a zone located below said forward edge of said first flap,

causing said cushion to support said forward edge zone and to form a temporary support during the absence of the supporting table,



moving said supporting table back to its pile-forming position after the discharge of the completed pile so that said forward edge zone contacts said supporting table,

stopping the formation of said gaseous fluid cushion under said forward edge zone of said first flap and restarting the operation of the swinging unit and the forward motion of said web.

5,062,598

DELIVERY SYSTEM FOR UNDER THE COUNTER CURRENCY DISPENSER

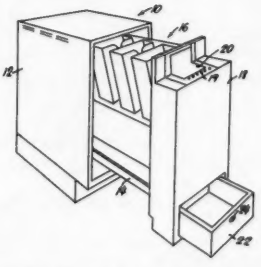
Theodore Winkler, Levittown, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Continuation of Ser. No. 371,499, Jun. 26, 1989, abandoned.

This application Dec. 28, 1990, Ser. No. 635,389

Int. Cl.[5] B65H *5/22*

U.S. Cl. 271—6 15 Claims



1. Apparatus for dispensing currency notes including in combination

a cabinet having a front provided with an opening forming a delivery location which is freely accessible to a user,

means fin said cabinet for holding a supply notes,

normally enabled conveying means extending from said supply means to said delivery location,

normally enabled means for removing notes from said supply and delivering removed notes to said conveying means,

a tray,

means mounting said tray at said delivery location for movement between an operative position at which it receives notes from said conveying means and an inoperative position at which notes conveyed to said delivery location pass by said tray to an escrow area in said cabinet,

means normally holding said tray in its operative position,

means responsive to a malfunction of said removing and delivering means for producing an error signal, first means responsive to said error signal for immediately disabling said removing and delivering means while said conveying means remains enabled,

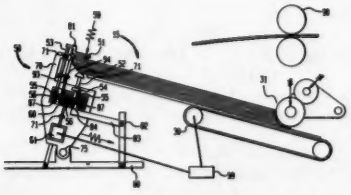
and second means responsive to said error signal for immediately moving said tray to its operative position and including a timer for maintaining said tray in its inoperative position until all notes received by said conveying means have been carried to said delivery location.

5,062,599

SHEET SEPARATING MECHANISM AND APPARATUS FOR USE THEREIN

Jon M. Kriegel, Rochester, and Richard E. Albrecht, Honeoye Falls, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 19, 1990, Ser. No. 495,512
Int. Cl.[5] B65H *3/52*
U.S. Cl. 271—35 **13 Claims**



1. A sheet separating mechanism comprising:

means for receiving a stack of sheets in a position in which the sheets and the stack have leading ends and trailing ends,

sheet retard means,

sheet separating means forming a nip with the sheet retard means, for engaging an outside sheet of a received stack and feeding a leading end of said sheet into said nip, and

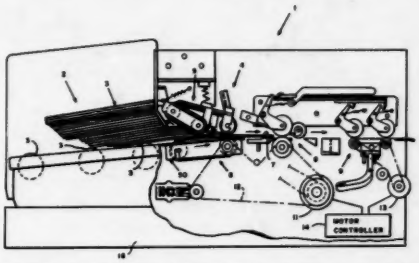
gripping and moving means for gripping the trailing end of the portion of said stack other than said outside sheet after said outside sheet has been moved toward or into said nip and for moving said stack in a direction away from said nip to reduce the force of the nip forcing the sheet adjacent said outside sheet against the outside sheet.

5,062,600

REPLACEABLE BELT CARTRIDGE FOR AN ENVELOPE FEED APPARATUS

Russell W. Holbrook, Middlebury, and Scott A. MacDonald, Bethel, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 14, 1989, Ser. No. 435,878
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—35 **4 Claims**



1. A detachable belt cartridge for detachable mounting in an envelope feeder apparatus, comprising:

a housing having spaced apart side walls, first and second end walls, and a top;

said top having a plurality of lengthwise slots formed therein;

a first and second shaft rotatively mounted in spaced apart relationship in said housing;

a plurality of wheels drivenly mounted on said first and second shafts;

a plurality of endless belts respectively extending around a respective one of said wheels of said first and second shafts such that a portion of said belt extends in a respective slot slightly above said top;

said apparatus having first support means for rotatively supporting portions of said first shaft at one end of said housing such that said first shaft may be slidably removed longitudinally from said first support, a second support means for detachably supporting said other end of said housing.

5,062,601

MILL SCREEN APPARATUS

Carl R. Graf, King of Prussia, Pa., assignor to Pennsylvania Crusher Corporation, Broomall, Pa.

Continuation of Ser. No. 410,140, Sep. 21, 1989, abandoned, which is a continuation of Ser. No. 198,027, May 24, 1988, abandoned. This application Aug. 28, 1990, Ser. No. 573,696
Int. Cl.[5] B02C *17/18*
U.S. Cl. 241—79.3 **25 Claims**

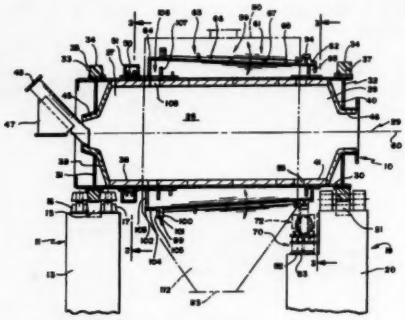
1. Co-rotating screen and reduction drum apparatus for reducing particulate materials, comprising:

(a) rotary drum particle size reduction means having a substantially imperforate drum,

(b) a rotary screen connected with said drum for co-rotation therewith, and having a perforate screening member with upstream and downstream portions, including upstream and downstream ends, said upstream portion of the screen surrounding at least a portion of the periphery of the drum, and

(c) means engaging an upstream portion of said screen and including a vibratory exciter for vibrating said upstream portion substantially independent of the drum, for restrict-

ing consumption of power that would otherwise be expended in vibrating the drum while promoting increased



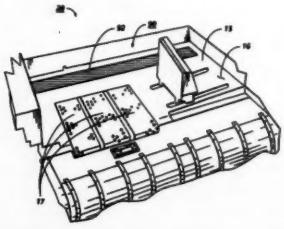
removal of fines from the particulate material through the upstream portion of the screening member.

5,062,602

DOUBLE FEEDING PREVENTION IN A BOTTOM SHEET DOCUMENT FEEDER

Glenn F. Kress, and Gerald L. Coy, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 24, 1990, Ser. No. 572,279
Int. Cl.[5] B65H *3/34*
U.S. Cl. 271—104 **6 Claims**



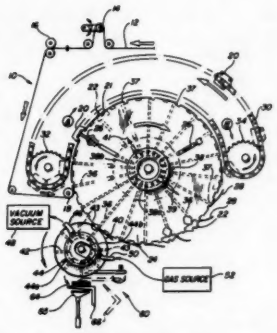
1. In a non-retard type bottom of stack sheet separating and feeding apparatus in which the bottom-most sheet is sequentially separated and fed out downstream by its downstream or lead edge from under the stack of sheets while the stack of sheets is generally supported on the bottom surface of a stacking tray thereof; the improvement comprising oriented fiber material mounted generally coplanar said bottom surface of said stacking tray and providing a substantial upstream area of said bottom surface of said stacking tray underlying and engaging a substantial upstream or trail edge area of said stack, said oriented fiber material having fibers which are predominantly angled upstream oppositely of said downstream sheet feeding direction to engage the trail or upstream edge area of the second-from-the-bottom sheet in said stack to resist its downstream movement as said bottom-most sheet is being initially separated and fed out.

5,062,603

VACUUM DRUM PURGE METHOD AND APPARATUS

David A. Smith, Midland, and James A. LaCombe, Bay City, both of Mich., assignors to Dow Brands Inc., Indianapolis, Ind.

Filed Apr. 25, 1990, Ser. No. 514,464
Int. Cl.[5] B65H *5/22*
U.S. Cl. 271—195 **13 Claims**



1. Apparatus for supplying gas to the vacuum ports of a vacuum drum comprising:

a source of vacuum and a source of gas;

a vacuum drum, including means for rotating said drum;

said drum including a plurality of vacuum ports on the surface thereof, said vacuum ports communicating with means for selectively exposing said vacuum ports to said vacuum source and said source of gas as said drum rotates, said exposing means comprising a plurality of vacuum passages each having a diameter and extending generally outwardly from the interior of said drum, each of said passages connected with a corresponding vacuum port; and

valve means for alternately connecting said passages to said vacuum source and to said source of gas, said valve means comprising a channel including at least one adjustable plug positioned in said channel, said plug having a width equal to or greater than the diameter of said vacuum passages.

5,062,604

INSTRUMENT DANEL ASSEMBLY FOR MOTOR VEHICLE DASHBOARD

Christian Monnier, Pontoise, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique Sagem, Paris, France

Filed Jun. 13, 1990, Ser. No. 537,334
Claims priority, application France, Jun. 13, 1989, 89 07790
Int. Cl.[5] B60K *37/00*
U.S. Cl. 248—27.1 **7 Claims**

1. An instrument panel assembly for a motor vehicle dashboard, comprising:

(a) a housing having a front window and a rear wall overlying and spaced from the front window, said rear wall having a plurality of display openings;

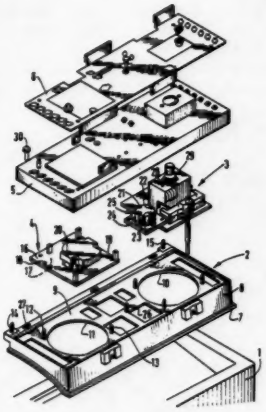
(b) a plurality of dashboard instruments, each having a dial face;

(c) means for precisely positioning the instruments on the rear wall of the housing, and for aligning a respective dial face with a respective display opening;

(d) a casing having a back wall;

(e) means for connecting the instruments to the back wall of the casing; and

(f) means for fixedly securing the casing with the instruments connected thereon to the housing, and for enclosing the



instruments between the back wall of the casing and the rear wall of the housing.

5,062,605

CABLE-LAYING CONDUIT

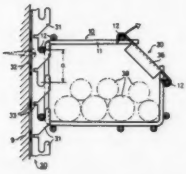
Erhard Muhlethaler, Schalunen, Switzerland, assignor to Lanz Oensingen AG, Oensingen, Switzerland

Filed Aug. 15, 1989, Ser. No. 393,735

Claims priority, application Switzerland, Aug. 17, 1988, 3070/88

Int. Cl.[5] F16L *3/00*

U.S. Cl. 248—68.1 **16 Claims**



1. A cable-laying conduit for building installation, said conduit having a rectilinear lateral cross-section, the improvement comprising:

a conduit having four sides and three corners; and

a longitudinal opening for insertion of cable located along the projected intersection of two of said sides of said conduit which are shorter than their opposite sides.

5,062,606

ADJUSTABLY TILTABLE TRIPOD STAND

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co. Ltd., Japan

Continuation of Ser. No. 339,009, Apr. 17, 1989, abandoned. This application Jun. 4, 1990, Ser. No. 541,206

Claims priority, application Japan, Aug. 29, 1988, 63-113189

Int. Cl.[5] F16M *11/00*

U.S. Cl. 248—171 **26 Claims**

1. A tiltable tripod stand comprising:

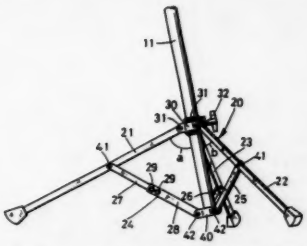
a main post;

three tripod legs, the legs having respective upper ends; a holding member journaled to the upper ends of the legs and movable along the main post for moving the upper ends of the legs along the main post;

the legs having lower ends for resting on a surface on which the tripod stand is supported;

a respective articulated arm hingedly journaled to each leg intermediate the ends of the leg and also hingedly journaled to the main post, wherein movement of the upper ends of the legs with respect to the main post, through the articulated arms, selectively folds the legs together to close the stand and opens the legs apart to a supporting condition by forming the lower ends of the legs into a triangle which supports the tripod stand;

one of the articulated arms being connected to one of the



legs and the one arm being adjustable in its length between the respective one leg thereof and the main post, selectively enabling the one articulated arm to have a different length than the other two articulated arms; the other two arms having no length adjusting means, whereby the respective lengths of the other two articulated arms between the respective legs and the main post are fixed and non-adjustable; with the legs in the supporting condition, the length of the one articulated arm is adjustable in length to cause the tilt angle, with respect to the main post, of the one leg connected to the one articulated arm to be adjustable with respect to the tilt angles with respect to the main post of the other two legs connected to the other two articulated arms, enabling the tilting of the main post generally toward one of the legs.

5,062,607

HOLDER FOR DETACHABLY MOUNTING A RECEPTABLE ON A LADDER

Howard A. Kisner, River Rd. PO 177-0177, Volga, W. Va. 26238

Filed Jan. 14, 1991, Ser. No. 640,831

Int. Cl.[5] E06C *7/14*

U.S. Cl. 248—211 **14 Claims**

1. A holder for detachably mounting a receptacle on a ladder, the holder comprising:

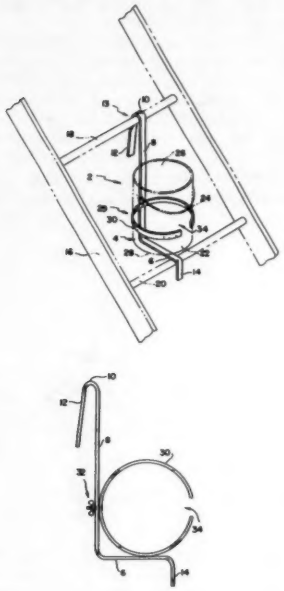
a generally L-shaped body member, said body member having a foot portion and a back portion, the receptacle resting on the foot portion when being held by the holder;

an extension portion connected to the back portion by a curved portion, the back portion, curved portion and extension portion forming a hook to attach the holder to a first rung of the ladder with the extension portion being positioned behind the first rung when the holder is mounted on the ladder;

a front portion connected to the foot portion of the body member, said front portion being positioned in front of a second rung of the ladder and at least the foot portion engaging the second rung of the ladder when the holder is mounted on he ladder, the first rung of the ladder being above the second rung; and

retainer means for holding the receptacle on he holder, the retainer means being pivotally attached to the back portion of the body member and the retainer means comprising a restraint member having a generally circular shape, the restraint member being attached to the back portion at

a predetermined position, the predetermined position being spaced from the foot portion of the body member by



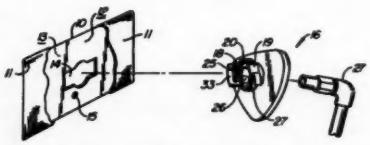
a distance which is greater than the radius of the restraint member.

5,062,608

VISOR MOUNT

Richard A. Phelps, Ferndale, and Brian S. Lorence, Warren, both of Mich., assignors to Chivas Products Limited, Sterling Heights, Mich.

Filed Apr. 23, 1990, Ser. No. 509,954
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—289.1 **22 Claims**



1. A toolless visor mount assembly, for use in mounting a visor to a panel of a vehicle, comprising:

a body, including an outer body portion, an inner body portion, and an intermediate body portion;

the vehicle panel having an outer surface, an inner surface, and a first opening formed therein, said first opening sized for receipt of the inner body portion and intermediate body portion when the body is at a first rotary orientation;

means for removably securing the body to the panel when the body is moved from the first rotary orientation to a second rotary orientation, said means including a pin carried by the inner body portion; and

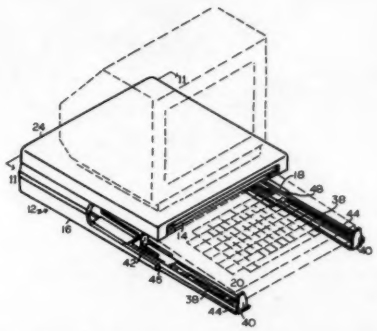
the panel including a second opening adapted to receive said pin when the body is at the second rotary orientation.

5,062,609

COMBINED KEYBOARD STORAGE, MONITOR SUPPORT AND DOCUMENT STORAGE SHELF APPARATUS

Edward L. Hames, Peterborough, N.H., and Robert Howitt, Leominster, Mass., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Continuation-in-part of Ser. No. 553,142, Jul. 16, 1990. This application Oct. 1, 1990, Ser. No. 591,460
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—676 **5 Claims**



1. A combined keyboard storage, monitor support and document storage shelf apparatus, which apparatus comprises:

a) a first support leg and a second support leg positioned in a generally parallel, spaced apart relationship, each having a U-shaped opening with a top and back surface, with an other side and a bottom surface an open front to define an open space;

b) means on the bottom surface of each support leg to retain a keyboard and to permit slideable movement of the keyboard between a stored, non-use position within the open space defined by the support legs and an extended, use position in front of the support legs;

c) a top flat support shelf to form a support surface for a monitor screen console characterized by a central drawing cavity disposed between a first and second side channel member comprising:

i) a short downwardly extending back; and

ii) the first side channel member in spaced relationship with the second side channel member for fitting in snug relationship over the top surface of the support legs to form a support surface for the monitor screen console, the first side channel member comprising a first downwardly extending side and the second side channel member comprising a second downwardly extending side and each side member characterized by a side rail cavity extending along the axis of the channel member and parallel to the top support shelf in spaced relationship therewith; and

d) a slideable, generally shallow document storage shelf means positioned directly beneath the support shelf and slideably positioned in the drawer cavity and slideably movable between a stored position directly beneath the support shelf and an extended user across position extending outwardly in front of the support leg comprising:

i) a drawer for supporting items for storage having a first and second side; and

ii) a plurality of spaced apart elongated side rail means extending outwardly from the sides of the drawer for resting on the top surfaces of the support legs to permit the drawer to be mutually slideably moved between a document storage position and an extended document access position.

5,062,610

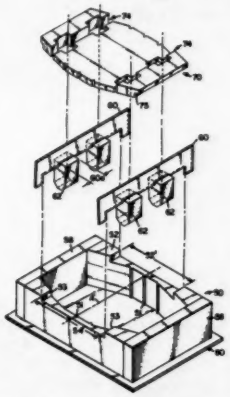
COMPOSITE MASONRY BLOCK MOLD FOR USE IN BLOCK MOLDING MACHINES

Michael E. Woolford, Lake Elmo, Minn., and Dick J. Sievert, New Richmond, Wis., assignors to Block Systems Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 413,400, Sep. 28, 1989, and a continuation-in-part of Ser. No. 413,050, Sep. 28, 1989. This application Jun. 7, 1990, Ser. No. 534,831

Int. Cl.[5] B28B *7/14, 7/18*

U.S. Cl. 249—52 **15 Claims**



12. A masonry block mold defining a concrete fill-receiving cavity which is open on top and bottom, thereby allowing the loading of fill through the top of the mold and allowing raking of the fill across the top of the mold and allowing the compressing of the fill and stripping of the mold to be accomplished by relative movement between the mold and a stepped compression head moving through the mold cavity from top to bottom, said mold comprising:

(a) a pair of opposed side walls bounding the sides of said cavity, each side wall comprising a top edge and a bottom edge, said bottom edges adapted to seat on a generally horizontal pallet as the fill is compressed during the molding process, and said top edges each comprising a first and second step, said first step forming a first end portion which is higher than an adjacent central portion, and being adapted to cooperate with a first step in the compression head as the fill is compressed during the molding process, said second step forming a second higher end portion separated from said first end portion by said central portion, and being adapted to cooperate with a second step in the compression head as the fill is compressed during the molding process; and

(b) means for holding fill adjacent said higher end portions at a level above that of the central portion of said top edges, said fill holding means comprising members extending across said mold cavity from one side to the other and adjoining the top edges of the sides in the regions of the steps.

5,062,611

SERVO OPERATED VALVE ASSEMBLY

Bruce M. Hatton, Carol Stream, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 31, 1990, Ser. No. 560,929

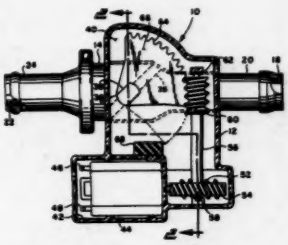
Int. Cl.[5] F16K *31/04, 51/00*

U.S. Cl. 251—129.11 **11 Claims**

1. A servo driven valve assembly comprising:

(a) a body means defining a flow passage therethrough communicating with a flow inlet and flow outlet;

(b) valve means disposed in said flow passage and rotatably movable therein between a closed position preventing flow from said inlet to said outlet and an open position permitting flow between said inlet and said outlet, said valve means including shaft means extending exteriorly of said flow passage, said body means including stop means for limiting movement of said valve means;



(c) motor driven means including actuator means connected to said shaft means, operable upon energization to move said valve means between said first and second positions; and,

(d) retarding means formed of resilient material associated with said stop means and operable to retard the stall of said motor.

5,062,612

SECURITY RAIL

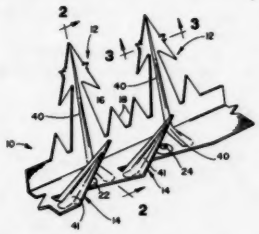
William H. Mincher, 2 Eden Road, Bramley, Johannesburg, Transvaal, South Africa

Filed Jul. 19, 1990, Ser. No. 555,236

Claims priority, application South Africa, Jul. 20, 1989, 89/5530

Int. Cl.[5] E04H *17/00*

U.S. Cl. 256—11 **3 Claims**



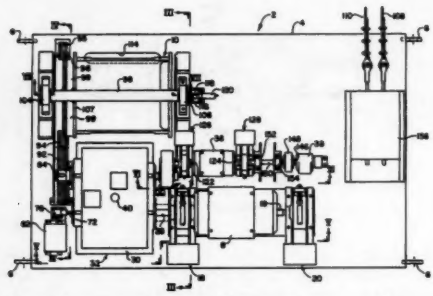
1. An elongate security rail comprising a land exstending in the long direction of the rail and being connectable to the top edge of a wall or fence frame, a first series of spikes in the form of barbed palings spaced apart along the length of the rail and situated to one side of the land, and a second series of spikes spaced apart along the length of the rail and situated to the opposite side of the land, the security rail being formed integrally from one of two identical, mirror image blanks which are produced from a single strip of flat metal, the blank including palings, spikes and the land, and the palings and spikes being bent up relative to the land so as to project from the opposite sides of the land and the barbed palings having arrowhead shapes and being spaced apart, on the relevant side of the land, by further spikes which are also bent up out of the plane of the flat metal strip.

5,062,613

TWO SPEED HOIST DRIVE ASSEMBLY

Peter Petrachkoff, Salem, Ohio, assignor to Fordees Manufacturing, Leetonia, Ohio

Filed Dec. 3, 1990, Ser. No. 620,708
Int. Cl.[5] C21B *13/00*; C21C *5/30*
U.S. Cl. 266—44 18 Claims



1. A basic oxygen furnace sublance hoist system, said system comprising:

a platform adapted for positioning above a basic oxygen furnace vessel;

means carried by said platform for suspending said sublance;

a first motor means carried by said platform for hoisting said sublance at a first speed through a region above a metal bath contained within said basic oxygen furnace vessel;

a second motor means carried by said platform for hoisting said sublance at a second speed for insertion and withdrawal of said sublance into and from said metal bath, said second speed being less than said first speed; and

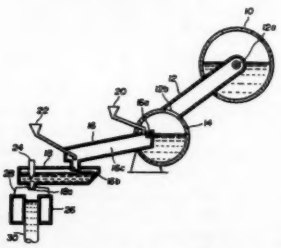
means operable by said first and second motor means for transmitting power to said means for suspending to enable hoisting of said sublance by said first and second motor means.

5,062,614

APPARATUS AND METHOD FOR MANUFACTURING COPPER-BASE ALLOY

Izumi Sukekawa, Matsudo; Haruhiko Asao, Abiko; Hiroshi Kohno, Iwaki; Yukio Sugawara, Iwaki, and Keiji Nogami, Iwaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Japan

Filed Aug. 28, 1987, Ser. No. 90,652
Claims priority, application Japan, Sep. 2, 1986, 61-206133
Int. Cl.[5] C21C *7/00*
U.S. Cl. 266—216 6 Claims



1. An apparatus for manufacturing a copper-base alloy, comprising:

an alloying spout inclined downwardly from one end toward the other end for flowing a molten copper therethrough, said alloying spout including an inlet at said one end and an outlet at said other end and having an elongated passageway through which said inlet communicates with said outlet, whereby the molten copper introduced from said inlet can flow downwardly through said passageway to said outlet;

a plurality of feeders for introducing solid solute constituents directly into said passageway of said alloying spout to thereby uniformly mix said solute constituents with said molten copper to produce a molten copper-base alloy, said feeders being connected to said alloying spout so as to be spaced longitudinally of said spout;

a tundish disposed at said other end of said alloying spout for receiving said molten copper-base alloy tapped from said alloying spout; and

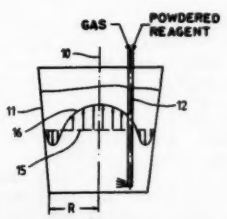
a heating furnace interposed between said alloying spout and said tundish for heating the molten copper-base alloy tapped from said alloying spout.

5,062,615

APPARATUS FOR THE INTRODUCTION OF REAGENTS IN POWDER FORM INTO A MELTING PAN

Frank Schaberg; Heribert Martens, both of Oelde, and Peter Pöhlmann, Munster, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Continuation of Ser. No. 345,442, May 1, 1989, abandoned. This application Sep. 17, 1990, Ser. No. 584,365
Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817358
Int. Cl.[5] C21C *5/32*
U.S. Cl. 266—217 4 Claims



1. Apparatus for the introduction of powdered reagents into a melting pan containing a melt and having a cylindrical base and a vertical center axis, said melt having its surface at a predetermined level above the base of said pan, said apparatus comprising a source of gas and powdered reagent, a lance projecting downwardly into said pan with its lower end portion forming a delivery outlet at a level between the surface of said melt and said base, and means communicating with said lance and said source for pneumatically supplying a gas and a powdered reagent to said lance for discharge through the delivery outlet of said lance into said melt, said lance being offset eccentrically of said axis of said pan, said delivery outlet of said lance comprising a pair of circumferentially spaced outlet nozzles at said lower end portion, each of said nozzles being directed wholly radially outwardly of said lance below the surface of said melt, one of said nozzles opening in a direction to one side of said axis and the other of said nozzles opening in a direction to the opposite side of said axis, said nozzles being spaced from one another at an angle in the range of 60° to 120°, said angle having its bisector intersecting said axis.

5,062,616

SELF-PUMPING HYDROPNEUMATIC SHOCK ABSORBING STRUT

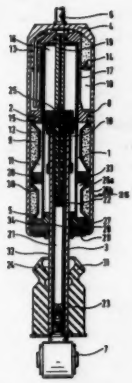
Norbert Sommer, Konigswinter, Fed. Rep. of Germany, assignor to Boge AG, Eitorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 349,004, May 9, 1989, Pat. No. 4,993,693. This application Apr. 30, 1990, Ser. No. 516,627

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914385

Int. Cl.[5] B60G *17/00*; F16F *9/36*

U.S. Cl. 267—64.17 16 Claims



1. A hydropneumatic shock absorbing strut, for connection between relatively moveable first and second elements of a vehicle, said first and said second elements each comprising one of axle means and body means of said vehicle, said shock absorbing strut comprising:

an elongated working cylinder having a first end and a second end;

said second end of said working cylinder having a piston rod hole therethrough;

a piston mounted on a piston rod;

said piston being disposed for movement within said working cylinder with said piston rod extending through said piston rod hole in said second end;

said first end of said working cylinder for being connected to said first element;

said piston rod for being connected to said second element;

said working cylinder for having oil disposed therein;

said oil in said working cylinder for damping movement of said piston within said working cylinder during relative movement of said first and said second elements;

a high pressure oil reservoir for containing pressurized oil at a higher pressure than the oil in said working chamber when the vehicle is stopped;

means, within said shock absorber strut, for pumping pressurized oil in said working cylinder into said high pressure oil reservoir when vehicle is moving;

wholly mechanical sensing means, on said shock absorber strut, for mechanically sensing that the vehicle has descended to a first general position;

wholly mechanical means within said shock absorber strut for supplying a quantity of pressurized oil from said high pressure oil reservoir to said working cylinder upon said sensing means sensing the first position of the vehicle;

said wholly mechanical means for supplying said quantity of said pressurized oil from said high pressure oil reservoir to said working cylinder for movement of said piston and the vehicle from the descended, first position of the vehicle towards a raised, second general position of the vehicle;

wherein said sensing means comprises a projection mounted to move with said piston rod;

said oil supplying means comprising valve means; and

said projection being disposed for pressing against and opening said valve means upon the vehicle attaining said first position for releasing pressurized oil from said high pressure oil reservoir for moving the vehicle to the raised second position.

5,062,617

SHOCK ABSORBING SUPPORT POST

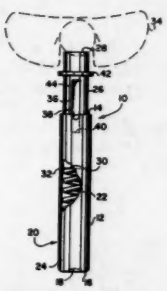
Raymond D. Campbell, Smith Falls, Canada, assignor to Camberfield Manufacturing Limited, Smith Falls, Canada

Filed Feb. 15, 1990, Ser. No. 480,769

Claims priority, application Canada, Jul. 11, 1989, 605298

Int. Cl.[5] B62J *1/02*; F16F *1/00*

U.S. Cl. 267—132 11 Claims



1. A shock absorbing support post for a seat comprising:

a tubular member having top and bottom ends;

shock absorbing means within said tubular member;

an elongated cylindrical stem partially within and in sliding engagement with said tubular member, a first end of said stem engaging said shock absorbing means and a second end of said stem extending outwardly of said tubular member;

means limiting the range of sliding movement of said stem longitudinally relative to said tubular member;

means restraining said stem against rotation in said tubular member; and

means for maintaining a predetermined resting force between said stem and said shock absorbing means, said means limiting, said means restraining and said means for maintaining comprising a longitudinally extending slot or keyway having upper and lower ends in said stem and a mating key in said tubular member and wherein said key and said keyway are positioned such that said lower end of said keyway brings up against said key to thereby stop sliding movement of said stem at a point where said predetermined resting force exists between said shock absorbing means and said stem.

5,062,618

VIBRATION-INSULATIVE SUPPORT MEMBER WITH CORDS

Yasuhiko Yamada; Minaki Tomio, both of Osaka; Toshiyuki Miyamae, Hyogo, and Norio Kawai, Osaka, all of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed Jun. 13, 1989, Ser. No. 365,459

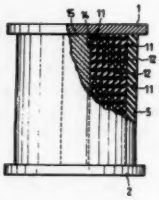
Claims priority, application Japan, Jun. 16, 1988, 63-148606

Int. Cl.[5] F16M *13/00*; F16F *7/00*

U.S. Cl. 267—140.4 23 Claims

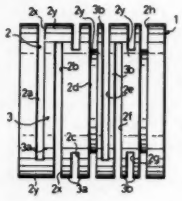
1. A vibration-insulative support member comprising an elastic body made mainly of rubber comprising a rubber portion, and a pair of upper and lower flanges secured to upper and lower ends of said elastic body, respectively; said elastic body including cords disposed in the rubber portion of said elastic body, said cords being arranged in at least two directly

adjacent layers substantially parallel to the upper and lower flanges in such a manner that said cords in each layer are



distributed in a plane substantially parallel to said upper and lower flanges.

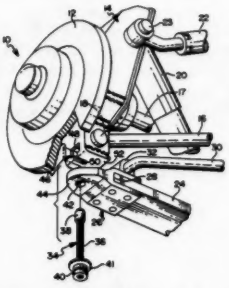
5,062,619
NON-LINEAR SPRING
Masahide Sato, Seki, Japan, assignor to Nabeya Kogyo Co., Ltd., Gifu, Japan
Filed Mar. 30, 1990, Ser. No. 502,489
Claims priority, application Japan, Apr. 3, 1989, 1-39461[U]; Jul. 29, 1989, 1-197408
Int. Cl.[5] F16F *1/02*
U.S. Cl. 267—154 **7 Claims**



1. A spring comprising:
an elongated spring body having a longitudinal axis;
a plurality of substantially parallel slits extending laterally through the spring body, each said slit extending more than half way through the spring body, the slits being arranged in sets, each set having at least two pairs of slits oriented at different phase angles, wherein the individual slits in each slit pair are angularly displaced substantially 180° relative to one another; and
a plurality of elastic portions respectively defined between adjacent slits, wherein the thicknesses of the elastic portions in a first set is different from the thicknesses of the elastic portions in a second set to provide the spring with a non-linear elasticity characteristic.

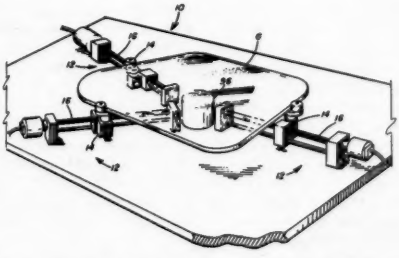
5,062,620
FLEXIBLE LINK AND METHOD FOR A VEHICULAR SUSPENSION SYSTEM
Christopher J. Martone, Rochester Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 20, 1990, Ser. No. 569,337
Int. Cl.[5] B60G *11/10*
U.S. Cl. 267—260 **6 Claims**

1. An automotive suspension system comprising:
a knuckle for receiving a wheel assembly;
a leaf spring mounted on a vehicle;
a spring hanger mounted onto an end of the leaf spring, the spring hanger including an opening; and
a flexible link for connecting the leaf spring to the knuckle including
a central flexible portion;
a first head connected to one end of the flexible portion, the first head inserted through the spring hanger opening and removably received into a complementary lot on the knuckle, and



a second head connected to an opposite end of the flexible portion for retaining the spring, whereby the flexible portion is received in the opening of the spring hanger.

5,062,621
ZERO DIAMETER LOCATOR POST
Donald A. Mackey, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 5, 1988, Ser. No. 279,695
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 269—305 **14 Claims**



10. An apparatus for positioning a sheet comprising:
a sheet support;
a plurality of positioning devices;
means for moving selected ones of said positioning device along a first axis toward said sheet support; and
each of said selected ones of said positioning devices moved along said first axis comprises:
a support block positioned on said first axis movable along said first axis toward said sheet support;
a stop assembly having a sheet engaging surface; and
means for mounting said stop assembly on said support block for movement about a second axis, said second axis transverse to said first axis with said engaging surface at said second axis wherein moving said support block along said first axis toward said sheet support moves said sheet engaging surface into contact with an edge of the sheet to position the sheet.

5,062,622

VIBRATORY SHEET FEEDER WHICH USES PHASE ADJUSTMENT TO CONTROL THE SHEET FEEDING SPEED

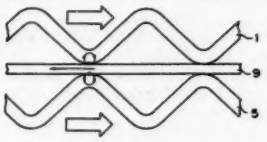
Kenichi Kataoka; Yoshifumi Nishimoto, both of Yokohama, and Masahiko Igaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

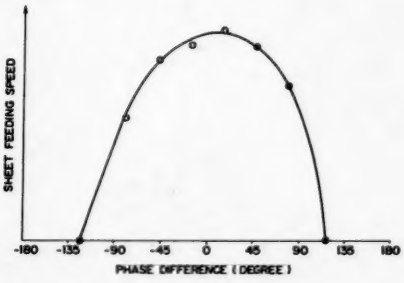
Filed Jan. 18, 1990, Ser. No. 466,952

Claims priority, application Japan, Jan. 19, 1989, 1-10380; Feb. 23, 1989, 1-44002

Int. Cl.[5] B65H *5/00*

U.S. Cl. 271—270 17 Claims





1. A sheet feeding device comprising:

a vibration member for generating vibration for feeding a sheet member, said vibration member having first and second vibration elements provided in positions for pinching said sheet member;

means for controlling the amplitude of vibration of said vibration member, in response to a change in the feeding speed of said sheet member; and

means for varying the phase difference between the vibration generated in the first vibration element and that in the second vibration element in accordance with the change in the feeding speed of the sheet member.

5,062,623

MULTIPLE DELIVERY SYSTEM

David A. Smith, Midland, and Clark M. Woody, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 159,133, Feb. 23, 1988, Pat. No. 4,919,415. This application Jul. 5, 1989, Ser. No. 375,662

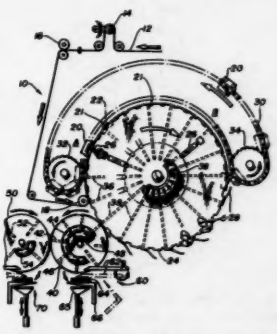
Int. Cl.[5] B65H *29/24*

U.S. Cl. 271—283 7 Claims

1. A high speed product delivery system comprising:

means for providing a series of individual flexible web products sequentially to a transfer point, said providing means including a vacuum product drum for conveying said individual products to said transfer point, means for rotating said drum, said vacuum product drum including a plurality of vacuum ports for securing a plurality of said individual products to said vacuum product drum during rotation thereof,

means for transferring individual ones of said products from said transfer point to a plurality of delivery points, said transfer means including a plurality of vacuum transfer drums, means for rotating said drums, said drums arranged such that the first of said plurality of transfer drums accepts products from said product drum and transfers at least a portion of said individual products to a succeeding transfer drum and at least a portion of said individual products to a first delivery point, each succeeding transfer



drum delivering at least that portion of said individual products received from said first transfer drum to succeeding delivery points, and

packing devices located adjacent each of said delivery points for removing said flexible products from each of said vacuum transfer drums, said packing devices including orbital packing fingers to contact and remove said flexible products.

5,062,624

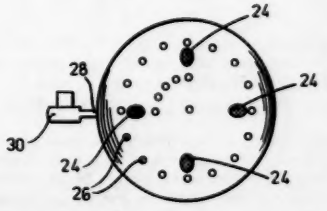
RIDING CAPSULE DEVICE

Victoria K. Reed, 1778 Peck La., Cheshire, Conn. 06410

Filed Oct. 24, 1986, Ser. No. 922,942

Int. Cl.[5] A63G *23/00*

U.S. Cl. 272—1 R 18 Claims



1. A riding capsule device comprising a capsule member and a base member, said capsule member including a generally egg-shaped body having a convex exterior shape with a bottom configuration in the form of a convex spherical segment, said base member having a flat bottom surface for stationary placement on a horizontal surface and a top configuration in the form of a concave spherical segment, said spherical segments engaging each other so that said capsule member can tilt and rotate with respect to said base member, under the impetus of an occupant of said capsule member, while confined thereby to a limited horizontal location.

5,062,625

HAND EXERCISER

Jan C. M. Vonk, 754 Adelaide St. West, Toronto, Ontario, Canada M6J 1B3

Filed Sep. 13, 1989, Ser. No. 406,554
Int. Cl.[5] A63B *23/16*
U.S. Cl. 272—67 11 Claims

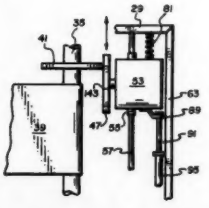
1. A hand exerciser comprising an elastomeric material having a plurality of finger engaging ports each connected to a respective elongate bridging segment with the bridging segments being connected to and extending outwardly from one side of a body portion spacing said finger engaging ports from said body portion, and wherein, in an unstressed state of said exerciser, said body portion to the side of said body portion opposite said one side including a thumb engaging port.

5,062,626

TREADMILL SPEED ADJUSTMENT

William T. Dalebout, Logan, and Jon Jensen, Providence, both of Utah, assignors to Proform Fitness Products, Inc., Logan, Utah

Filed Feb. 20, 1990, Ser. No. 482,222
Int. Cl.[5] A63B *23/06*
U.S. Cl. 272—69 6 Claims



1. In a treadmill having a frame, a pair of spacedly positioned drums, a first said drum being rotatably mounted on said frame for rotation about a first rotational axis, and a belt trained over said drums to extend therebetween, the improvement comprising:

a first planar sided, circular disk mounted on said first drum for rotation about said first rotational axis, a rotation of said first planar sided, circular disk effecting a corresponding rotation of said first drum and, in turn, a rotation of said belt;

a drive head mechanically engaging said first planar sided, circular disk, said drive head having a planar drive surface, said drive head planar drive surface defining a plurality of concentric circular paths which vary dimensionally in circumference, said first planar sided, circular disk riding on said planar drive surface along one of said circular paths;

a drive means mounted to said drive head for rotating said drive head about a second rotational axis, said drive means being displaceably mounted on said frame for displacement along a linear path parallel to said first rotational axis, a displacement of said drive means causing a resultant change in the identity of said circular path of said drive head on which said first planar sided, circular disk rides, said first rotational axis being oriented perpendicular to said second rotational axis; and

a control means, mounted to said frame and connected to said drive means, said control means being adapted for selectively displacing said drive means along said linear path;

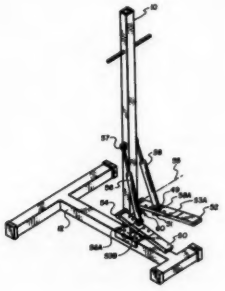
wherein an angular velocity of said first is selectively adjustable by displacing said drive means along said linear path and thereby varying the identity of said circular path being traveled over by said first planar sided, circular disk.

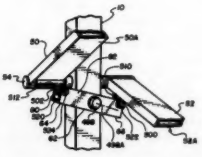
5,062,627

RECIPROCATOR FOR A STEPPER EXERCISE MACHINE

Curt G. Bingham, Logan, Utah, assignor to Proform Fitness Products, Inc., Logan, Utah

Filed Jan. 23, 1991, Ser. No. 644,456
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—70 12 Claims





1. An exercise machine comprising:

frame means for positioning on a support surface;

left lever means pivotally secured to said frame means for movement relative thereto by a user;

right lever means pivotally secured to said frame means spaced from and in general alignment with said left lever means for movement relative to said frame means by a user;

resistance means interconnected between said left lever means and said frame means and between said right lever means and said frame means to resist movement thereof;

rocker means attached to said frame means having a left end extending under said left lever means and a right end extending under said right lever means, said rocker means having a rotation axis about which said left end and said right end rotate;

left tracking roller means attached to the left end of said rocker means for movement therewith;

right tracking roller means attached to the right end of said rocker means for movement therewith;

left engagement means attached to the underside of said left lever means to engage said left tracking roller means for urging said left tracking roller means to track along said left engagement means upon movement of said left lever means; and

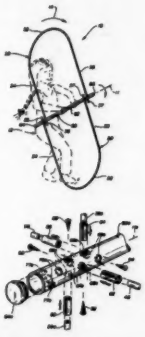
right engagement means attached to the underside of said right lever means to engage said right tracking roller means for urging said right tracking roller means to track along said right engagement means upon movement of said right lever means.

5,062,628

EXERCISING DEVICE

Bennington R. Heyn, 1009 Alexander Ave., Ridgefield, N.J. 07657, and Joseph J. Gartner, 334 W. Shore Dr., Wyckoff, N.J. 07481

Filed Mar. 9, 1990, Ser. No. 491,099
Int. Cl.[5] A63B *5/20*
U.S. Cl. 272—75 **8 Claims**



1. An exercising device comprising:

a crossbar, extending axially in only one direction, for holding and turning about an axis of rotation by a user;

at least a first, one-piece, bendable member for forming a first hoop, said member including two end portions;

said end portions each having a fixed connection to the crossbar, each said fixed connection including a thru-hole in the crossbar and a portion of the corresponding end portion received in means for restraining axial movement of said end portion in said thru-hole,

each said end portion and said thru-hold cooperatively adapted whereby each said end portion can be adjustably positioned in the corresponding thru-hole by the application of a preselected force such that the size of the hoop can be variably adjusted to accommodate the size of each particular user, and whereby

each said end portion and said corresponding means for restraining axial movement in said corresponding thru-hole includes a press fit relationship therebetween whereby, after the hoop size is set, the end portion is thereafter substantially restrained in axial movement in the corresponding thru-hole until said preselected force is once again applied.

5,062,629

SURFING SIMULATOR

Jeffrey R. Vaughan, Rte. 2-Box 324, Swall Meadows, Bishop, Calif. 93514

Filed Feb. 20, 1991, Ser. No. 658,000
Int. Cl.[5] A63B *69/18*
U.S. Cl. 272—97 **6 Claims**

1. A surfing simulator comprising a supporting base, a turntable bearing removably attached concentrically upon the base to allow 360 degrees rotational motion, a plurality of springs having means for removable attachment to the upper surface of said turntable bearing to allow up-and-down motion, a cover plate, removably attached to the upper ends of said springs, thereby controllably coupling the up-and-down motion of said springs and the rotational motion of said turntable bearing a mounting pad deployed on the upper surface of said

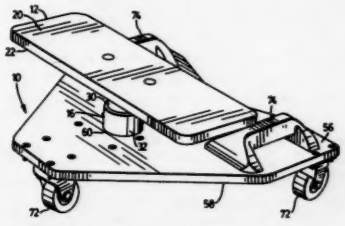
coverplate for resiliently mounting an elongated riding deck intermediate its length to the upper surface of said coverplate thereby coupling the riding deck to said coverplate, springs, turntable bearing and supporting base disposed concentrically thereunder.

5,062,630

GYMNASTIC TRAINING DEVICE

Riley H. Nelson, Oshawa, Canada, assignor to 859545 Ontario Ltd., Bowmanville, Canada

Filed Mar. 6, 1990, Ser. No. 488,563
Claims priority, application Canada, Aug. 21, 1989, 608851
Int. Cl.[5] A63B *22/20*
U.S. Cl. 272—111 **24 Claims**



1. A gymnastic balancing training device comprising:

(a) first substantially horizontal support platform defining an upper side and a lower side, said lower side having a central portion;

(b) a substantially vertical support member having first and second ends, said first substantially horizontal support means mounted on one end of said support member within said central portion;

(c) means for permitting rotation of said first substantially horizontal support platform in a substantially horizontal plane about said substantially vertical support member;

(d) ground engaging wheel means mounted to the other end of said substantially vertical support member;

(e) a generally horizontal second substantially horizontal support platform defining an upper side a lower side and a second central portion; and

(f) three rotatably mounted wheel means attached to said lower side of said second substantially horizontal support platform, said rotatably mounted wheel means spaced to define a triangle which encompasses said ground engaging wheel means, the lowermost portion of said ground engaging wheel means being lower than the lowermost portion of each of said rotatably mounted wheel means

when the plane defined by said rotatably mounted wheel means is horizontal;

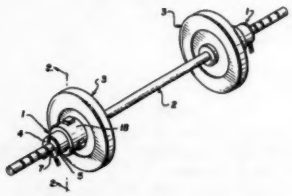
said substantially vertical support member and said ground engaging wheel means being adapted to co-operate with said first substantially horizontal support platform to provide a mobile surface for the user to balance upon, said substantially vertical support member being attached to said second substantially horizontal support platform within said central portion at a location on said substantially vertical support member between said ground engaging wheel means and said first substantially horizontal support platform.

5,062,631

BARBELL CLAMP

William S. Dau, 4707 Olympia Ave., Beltsville, Md. 20705, and Ernest Jaen-Guardia, Jr., 7910 Innkeeper Dr., Severn, Md. 21144

Filed May 17, 1990, Ser. No. 524,476
Int. Cl.[5] A63B *21/075*
U.S. Cl. 272—123 **9 Claims**



1. A barbell comprising, a lift bar, a plurality of longitudinally spaced slots provided on each end portion of said lift bar, interchangeable weights slidably mounted on each end portion of said lift bar, a flange on each end portion of the lift bar, the inner face of a weight on each end portion of the bar abutting a respective flange, and a clamp assembly connected to each end portion of the lift bar to prevent the weights from sliding off each end of the bar, each clamp assembly comprising a hub member slidably mounted on the end portion of the lift bar and abutting the outer face of the weight, a pair of semi-circular jaws pivotally connected to the hub member and engaged within a selected lift bar slot, whereby the end of the hub member is held against the outer face of the weight to thereby prevent the clamp assembly from becoming loose during the exercise workout.

5,062,632

USER PROGRAMMABLE EXERCISE MACHINE

William T. Dalebout, and Michael Burk, both of Logan, Utah, assignors to Proform Fitness Products, Inc., Logan, Utah

Filed Dec. 22, 1989, Ser. No. 455,631
Int. Cl.[5] A63B *21/005*
U.S. Cl. 272—129 **14 Claims**

1. An exercise apparatus, comprising:

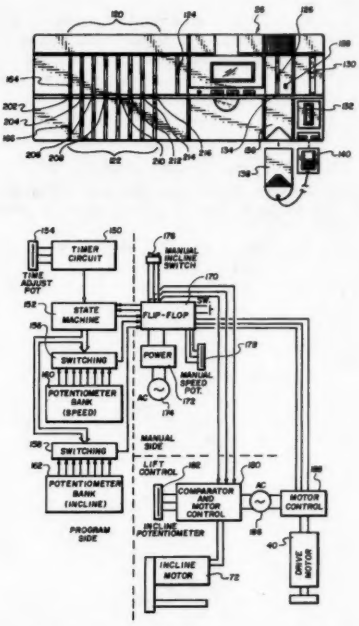
a frame;

a moveable member mechanically associated with said frame for repetitive user movement with movement of said moveable member;

adjustment means associated with said moveable member and adapted to selectively vary the difficulty of user movement with movement of said moveable member;

a plurality of indicators associated with said frame proximate each other, said plurality of indicators being moveable with respect to each other by the user to select and to continually visually indicate a sequential set of relative values of said difficulty; and

control means operatively linked with said indicators to receive said sequential set of relative values of said difficulty therefrom and with said adjustment means to supply control signals thereto, said control means being adapted to vary said difficulty of user movement with movement



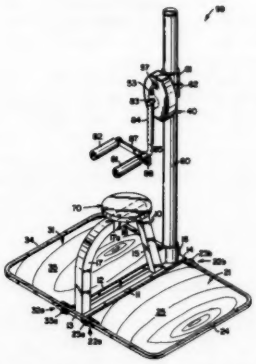
of said moveable member in the sequence selected by said user through said indicators.

5,062,633

BODY-BUILDING EXERCISE APPARATUS

Timothy S. Engel, Bloomington, and Robert A. Iverson, Eden Prairie, both of Minn., assignors to Nordictrack, Inc., Chaska, Minn.

Filed Aug. 31, 1990, Ser. No. 575,968
Int. Cl.[5] A63B *21/015*
U.S. Cl. 272—132 **8 Claims**



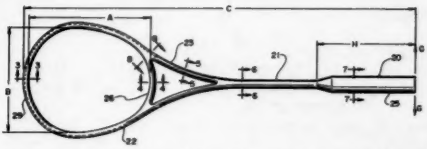
6. An exercise apparatus according to claim 5, wherein said adjustable resistance means includes a pair of opposing pads positioned on opposite sides of said disc, a pair of spring washers adjacent one of said pads, and a threaded adjustment knob

adjacent one of said washers, wherein rotation of said knob in one direction increases pressure between said washers and between said pads and said disc, and rotation of said knob in an opposite direction decreases pressure between said washers and between said pads and said disc.

5,062,634
SQUASH RACKET

Eric C. Strauch, Chicago, and William D. Severa, Addison, both of Ill., assignors to Wilson Sporting Goods Co., River Grove, Ill.

Filed Aug. 31, 1990, Ser. No. 574,581
Int. Cl.[5] A63B *49/02*
U.S. Cl. 273—67 R **15 Claims**



1. A squash racket comprising a frame having a head portion adapted to support a strung surface, a handle portion adapted to be held by a player, a shaft portion connected to the handle portion, and a throat portion connecting the handle portion and the head portion, the improvement characterized by the racket having:

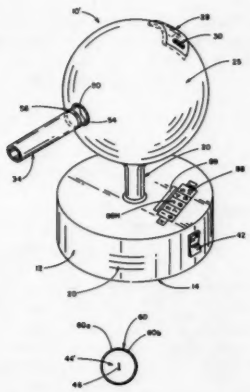
a) a weight within the range of about 150 to about 175 grams, and

b) a center of gravity located closer to the head end of the racket than the handle end of the racket.

5,062,635
NUMBER GENERATING DEVICE WITH MAGNETIC BIASING MEANS

Kam Y. Tse, and Leonard J. Wong, both of 63-75 Carlton St., Rego Park, N.Y. 11374

Filed Jul. 25, 1989, Ser. No. 384,793
Int. Cl.[5] A63B *71/00*; A63F *1/18*
U.S. Cl. 273—144 A **1 Claim**



1. A number generator for use in generating lottery numbers comprising:

A) a base having a cylindrical wall with air inlet vents defined therein, and a bottom;

B) an updraft channel mounted on said base;

C) a spherical container mounted on said channel, said container having a chamber defined interiorly thereof, said chamber being fluidically connected to said channel to receive air therefrom;

D) an inlet opening defined in said container;

E) a door hingeably mounted on said container to open and close said inlet opening;

F) an outlet chute connected to said container to be fluidically connected to said chamber, said chute having a longitudinal axis;

G) a multiplicity of balls, each having a number thereon, said balls being of different sizes with balls having numbers 1 through 5 thereon being smaller than balls having numbers 6 through 0 thereon, said balls being combined in said chute to form a series of number; and

H) selection means for selecting one ball over another, said selection means including

(1) a fan mounted in said housing and oriented to force air from said housing into said updraft channel towards said chamber,

(2) power means for operating said selection means,

(3) switch means connecting said fan to said power means and for controlling operation of said fan by selectively connecting and disconnecting said fan and said power means, and

(4) chute covering means on said chute to selectively open and close said chute to said chamber, said chute covering means including a butterfly disc rotatably mounted in said chute and a handle connected to said disc and extending outside said chute; and

(I) influencing means for biasing the selection of one ball over another to move into said chute, said influencing means including

(1) a magnet on each ball, each magnet being oriented so that only a single pole thereof faces outwardly of each ball,

(2) an electromagnet mounted adjacent to said chute, said electromagnet being connected to a source of power and being turned on and off to influence said ball mounted magnets when said electromagnet is turned on.

(3) a programmed microprocessor means for controlling said electromagnet and a shutter means according to a program stored in said microprocessor means,

(4) said shutter means mounted adjacent to said chute and adjacent to said electromagnet and being opened and closed to permit selected ones of said balls to move into said chute, said shutter means including

(a) a plurality of steel shutter leaves each of which includes a pivot about which it rotates in such a way as to open said shutter means when said shutter leaves move out in a direction away from said chute longitudinal axis and to close said shutter means when said shutter leaves are moved back toward said chute longitudinal axis,

(b) a drive element connected to said microprocessor means to be connected by said microprocessor means to a source of power to operate said shutter leaves according to the program stored in said microprocessor means,

(c) shutter operating pins engaged against said drive element,

(d) an actuating ring connected to said operating pins, said actuating ring including a plurality of slots,

(e) shutter closing pins on said actuating ring in position to engage against said drive element to close said shutter, and

(e) a ball sensor mounted in said chute.

5,062,636
THREAD PROTECTOR AND TIP MAINTENANCE DEVICE FOR A BILLIARD CUE
Peter R. Rahn, 1460A S. 77th St., West Allis, Wis. 53214
Filed Jan. 26, 1990, Ser. No. 470,907
Int. Cl.[5] A63D *15/08*
U.S. Cl. 273—68 12 Claims

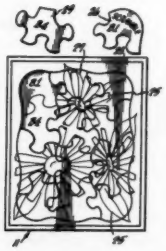
1. A protective and maintenance apparatus for a billiard cue that includes two sections coaxially attached at adjoining cue ends, one of which adjoining cue ends is provided with an axially extending threaded stud and the other of which adjoining cue ends is provided with a threaded axial bore for receipt of the stud to assemble the cue for use, after which it may be disassembled for storage and transport, said apparatus comprising:

a first end protector having a body, a threaded protector stud attached to said body and extending from one end of said body, said protector stud having a thread pattern corresponding to the thread stud on the one adjoining cue end for receipt in the threaded axial bore in the other adjoining cue end;

a second end protector having a body, a threaded protector bore in one end of said body, said protector bore having a thread pattern corresponding to the threaded axial bore in the other adjoining cue end; and,

a concave cue tip scuffing means adapted to receive a cue tip and recessed in one of said first and second end protector bodies for maintaining the surface of the cue tip.

5,062,637
METHOD OF PLAYING A JIGSAW PUZZLE BOARD GAME
William J. Bianchi, 10935 S. Fulton Wells Ave., Apt. 105, Santa Fe Springs, Calif. 90670
Filed Jan. 22, 1990, Ser. No. 467,902
Int. Cl.[5] A63F *9/10*
U.S. Cl. 273—157 R 2 Claims



1. A method of playing a game with game boards comprising jigsaw puzzles wherein each such game board has a surface for normally supporting a plurality of jigsaw-type game pieces and including for each game a plurality of such game pieces, the surface of each board having outlines of game pieces, each game piece having first indicia thereon indicating the location of the game piece on its respective game board and board indicia which identifies its respective game board, and wherein at least one game piece of each game board has a second unique indicia on the bottom of at least one such game piece, the method comprising the steps of

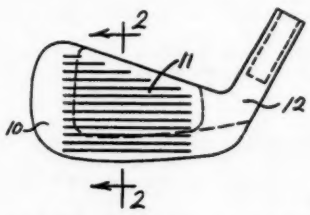
removing game pieces from at least first and second game boards, and grouping and mixing the game pieces of said first and second boards together,

a first player of two players selecting a number of game pieces the number being defined by the method of playing the game, keeping those selected which came from the respective player's board as indicated by the board indicia and returning those which came from another player's board, and placing the remaining selected pieces in that respective player's game board,

moving that player's game board to the next player if one of the selected and retained game pieces has the second unique indicia thereon, and

continuing play substantially according to the foregoing steps until all game pieces have been returned to one game board.

5,062,638
METHOD OF MAKING A GOLF CLUB HEAD AND THE ARTICLE PRODUCED THEREBY
Chester S. Shira, 3645 Ruffin Rd., Suite 125, San Diego, Calif. 92103
Division of Ser. No. 465,831, Jan. 16, 1990, Pat. No. 4,992,236.
This application Oct. 22, 1990, Ser. No. 606,980
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—167 R 10 Claims



1. A unitary golf club head having a substantially exposed and essentially metallic toe, sole, face, and heel and made from metal powders, said clubhead having an outer perimeter configured to optionally contain inserts made from a material selected from the group consisting of castings, wrought metal and green compacts of metal powders and combinations thereof, and characterized by the density of the material in said golf club head being nearly 100 percent of the theoretical density of said material in said golf club head when said material is in solid form.

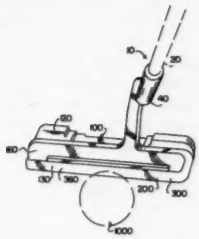
5,062,639
SUPPLEMENTARY IMPACT DEVICE FOR A GOLF CLUB
Otis H. Hitt, 3520 Gas Lite Dr., Archbold, Ohio 43502
Filed Jul. 11, 1990, Ser. No. 551,153
Int. Cl.[5] A63B *69/36, 53/04*
U.S. Cl. 273—171 2 Claims

1. A supplementary impact device for improving the performance of a golf club having a striking head, which striking head has a frontal striking face and a posterior face which opposes the frontal striking face, said impact device adapted to be connected to the striking head of the golf club, and comprising:

(a) a longitudinally extending bar member having a longitudinally extending axis, a predetermined height, a frontal surface along the entire length thereof for stroking engagement with a golf ball, and a posterior surface, said predetermined height of said bar member being substantially less than the height of said frontal striking face of said club head to provide a concentrated weight mass

along the longitudinal axis thereof to enhance the hitting power of said club during the ball stroking process; and

(b) spacing means protruding from the posterior surface of said bar member at opposite ends thereof for connecting said bar member to the frontal striking face of said club



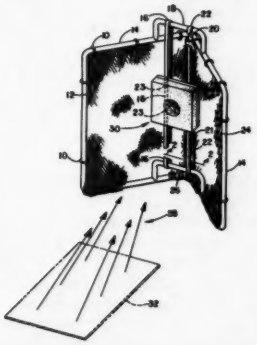
head so that said bar member extends over the full length of said head and said bar member is continuously spaced forwardly of the frontal striking face of said club head along the full length of said bar member between said protruding spacing means.

5,062,640

PRACTICE DEVICE FOR GOLFERS

Patrick F. Haley, 3529 Caballero La., N. Highlands, Calif. 95660

Filed Dec. 31, 1990, Ser. No. 636,448
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—176 F **7 Claims**



1. A golf practice apparatus, comprising:

(a) a frame,

(b) a backstop, said backstop supported by said frame, said backstop including a first screen portion and a second screen portion said first and second screen portions being positioned to form a vertical, generally "V" or "U" shaped angle there between;

(c) a target including an opening, said target projecting forward from said backstop junction of said first and second screen portions;

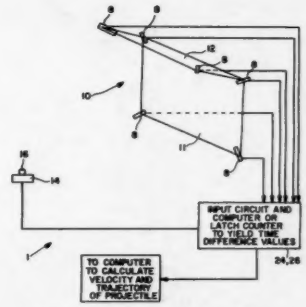
(d) attachment means for flexibly attaching said target to said frame.

5,062,641

PROJECTILE TRAJECTORY DETERMINATION SYSTEM

Nannette Poillon, Stamford; Howard Canistraro, West Hartford, and Ronald F. Sienko, Southbury, all of Conn., assignors to Nannette Poillon, New York, N.Y.

Filed Sep. 28, 1989, Ser. No. 413,789
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—181 C **9 Claims**


INPUT CIRCUIT AND COMPUTER OR LATCH COUNTER TO YIELD TIME DIFFERENCE VALUES
TO COMPUTER TO CALCULATE VELOCITY AND TRAJECTORY OF PROJECTILE

1. A system for determining the point of impact and velocity of a projectile that is driven from a start point and impacted upon a screen, comprising:

a start point which is a known position from which the projectile commences its flight;

a target screen located a fixed distance from said start point and adapted to be impacted by the projectile;

at least three sound wave detectors adapted to be located at predetermined locations adjacent to any portion of said screen, each of said sound wave detectors being disposed to receive a sound wave originating and radiating from the point of impact of the projectile on said screen;

first means for measuring the distance from said start point to the actual point of impact of the projectile on said target screen, and for determining the flight time of the projectile;

second means for determining the first time the sound wave reaches each of said sound wave detectors;

third means for determining the time difference values amongst said second means determinations to calculate by using an algorithm that is based upon the pythagorean theorem the calculated point of impact of the projectile; and

fourth means for calculating the initial velocity of the projectile by using said first means and the calculated point of impact of said third means to calculate three vector components of the initial velocity of the projectile;

wherein said third means and said fourth means provide a calculated point of impact and a calculated initial velocity, respectively.

5,062,642

TRAINING DEVICE

Troy R. Berry, 4924 Pershing, Fort Worth, Tex. 76107, and Larry R. Mills, 7258 Valleydale Ct., Fort Worth, Tex. 76116

Filed Sep. 12, 1990, Ser. No. 581,037
Int. Cl.[5] A63B *69/36, 21/04, 21/02, 21/00*
U.S. Cl. 273—183 B **4 Claims**

1. A training device adapted to be worn by a user, comprising in combination:

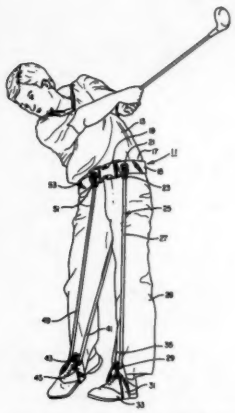
a belt adapted to be connected around a waist of a user, with a back section extending around the back of the user and having a front section located on the front of the user;

fastening means on the front section of the belt for fastening the belt around the user;

an elastic strap having two forward runs and two rearward

runs, each of the forward runs having an upper end joining the front section of the belt and extending downward to a lower end, and each of the rearward runs having an upper end joining the back section of the belt and extending downward to a lower end;

loop means for retaining the lower ends of one of the forward runs and one of the rearward runs with one foot of



the user and for retaining the other of the forward runs and rearward runs with the other foot of the user; and wherein

the loop means comprises a flexible loop which is adapted to receive the user's foot, with the forward and rearward runs sized to be in tension, and with the loops pulling upward on an arch of the user's foot when the user's legs are straightened.

5,062,643

GOLFING AID

Carter S. Bibbey, 2508 Wildrose Ct., and Jack L. Williams, 2405 Castle Rock Rd, both of Arlington, Tex. 76006

Filed Feb. 5, 1991, Ser. No. 650,745

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—188 A **28 Claims**

1. A golf aid for limiting and restricting a golfer's front shoe and foot from undesirable movement during the backswing and swing when the golfer's shoe and foot are placed in use position in the golf aid device on a ground surface, comprising:

an outside base member having front and rear end portions and a contact surface between the end portions for contact with the outside edge part of a golfer's shoe;

an inside base member having front and rear end portions and a contact surface between the end portions for contact with the inside edge part of said golfer's shoe;

a connecting device bridgeable over the front portion of said golfer's shoe when said shoe is placed between the spaced apart base members in use position with the contact surfaces proximate the edge parts of the golfer's shoe, said connecting device connecting a front portion of the outside base member with the inside base member; and

means for removably securing the inside and outside base members to a ground surface in an adjustably spaced apart relationship to each other so that said golfer's aid will tend to prevent the golfer's front foot from lifting and turning or pivoting during the swing to condition the golfer to keep the front foot planted during his swing.

5,062,644

GOLF BALL

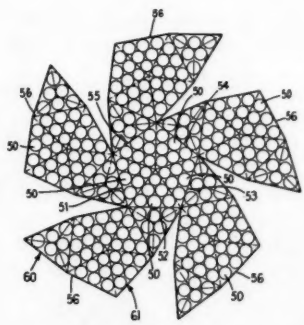
Young-Bum Lee, Seoul, Rep. of Korea, assignor to Accufar Golf Co., Ltd., Mokpo, Rep. of Korea

Filed Jun. 13, 1990, Ser. No. 538,028

Claims priority, application Rep. of Korea, Nov. 6, 1989, 89-16030

Int. Cl.[5] A63B *37/14*

U.S. Cl. 273—232 **13 Claims**



1. In a golf ball including an outer cover having a spherical outer surface, said spherical outer surface having a plurality of dimples formed therein and arranged in a repeating pattern, said repeating pattern being defined by projecting onto said spherical outer surface the edges of an icosidodecahedron having 20 regular triangular faces and 12 regular pentagonal faces, and the edges of said icosidodecahedron, as projected onto said spherical outer surface, defining 6 circular dividing lines on said spherical outer surface, the improvement comprising:

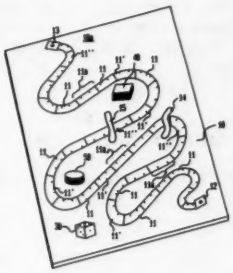
said outer cover including two molded cover parts having respective hemispherical outer surfaces which adjoin one another along a generally circular mold parting line to define said spherical outer surface, said mold parting line being coincident with one of said 6 dividing lines, all of said dimples being arranged in nonintersecting relationship relative to said mold parting line and the dividing line coincident therewith, and the remaining 5 dividing lines each being intersected by at least one of said dimples, whereby said dimples are arranged evenly and uniformly over said spherical outer surface.

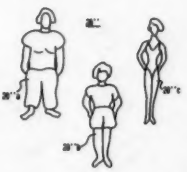
5,062,645

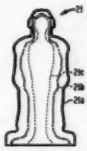
FITNESS AND NUTRITION GAME APPARATUS AND METHOD OF PLAY

Meri Goodman, 14 Clover Pl., Cos Cob, Conn. 06807, and Phyllis Schondorf, 21 Herthstone Dr., Riverside, Conn. 06878

Filed Nov. 5, 1990, Ser. No. 608,818
Int. Cl.[5] A63F *3/00, 9/18;* G09B *19/00*
U.S. Cl. 273—249 5 Claims







1. A fitness and nutrition education game apparatus comprising

a playing board having a plurality of contiguous playing spaces disposed thereon defining a playing path, said playing spaces having player directives marked thereon, said player directives including directions to select one of a first plurality of playing cards and directions to select one of a second plurality of playing cards, said playing board further having two stations marked thereon disposed between adjacent contiguous playing spaces at spaced locations, said stations defining points along said playing path where a player can change body image representations in accordance with the rules of play;

a set of playing pieces for each player comprising separate representations of respective body images, said body image representations being nestable;

chance means for determining the number of spaces a player can advance a playing piece along the playing path;

a first plurality of playing cards each having printed thereon a first question of moderate difficulty about nutrition, diet, exercise and fitness and a corresponding first answer to the first question; and

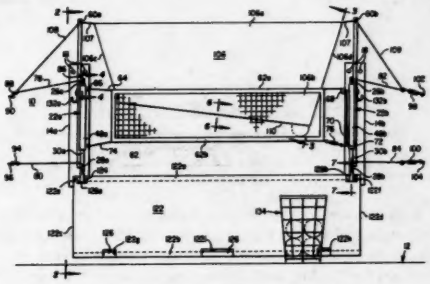
a second plurality of playing cards each having printed thereon a second question of advanced difficulty about nutrition, diet, exercise and fitness and a corresponding second answer to the second question.

5,062,646

VOLLEYBALL TRAINING APPARATUS

Michael A. Crist, Rte. 2 Box 82, Ewing, Mo. 63440-9424

Filed Jan. 3, 1991, Ser. No. 637,276
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—411 19 Claims



1. A surface-mountable volleyball training apparatus, comprising:

a pair of vertically extending rigid frames disposed in horizontally spaced relation to one another which are attached to an upright surface and project outwardly from said surface;

said frames being pivotably attached to said surface for swinging movement relative to said surface and to one another; and,

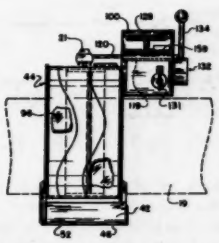
a net supported between said frames in spaced relation to said surface.

5,062,647

TOY SIMULATOR

Edward G. Chanter, Lakewood, Ohio, and Randy J. Randleman, Stillwater, Minn., assignors to Those Characters from Cleveland, Inc., Cleveland, Ohio

Filed Jan. 4, 1990, Ser. No. 460,766
Int. Cl.[5] A63F *9/14*
U.S. Cl. 273—442 18 Claims



1. A toy for testing and simulating the driving skills of a user comprising:

a support unit for removably mounting said toy upon a limb of the user;

a circular drum removably mounted for rotation upon said support unit;

a travel path formed upon the outer diameter of said drum;

a travel element positioned above said drum;

control means for altering the position of said travel element relative to said travel path;

motor means for rotating said drum in a first direction and an opposite second direction relative to said support unit; and

circuit means for selectively controlling the rotational direction of said motor means.

5,062,648

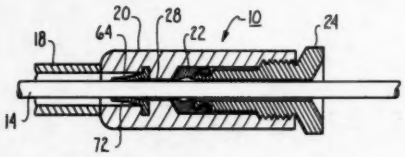
SEAL FOR ROTATING TORQUE TUBE WITH SEAL VALVE

Gary G. Gomringer, Escondido, Calif., assignor to InterVentional Technologies, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 413,003, Sep. 26, 1989. This application Mar. 21, 1990, Ser. No. 496,883

Int. Cl.[5] F16J *15/18;* **A61M** *25/00;* **F16K** *15/14*

U.S. Cl. 277—112 **26 Claims**



1. A device for preventing leakage when establishing a fluid-tight seal around a rotatable drive shaft which comprises:

resilient means for radially surrounding said drive shaft;

means for holding said resilient means on said drive shaft;

means for urging said resilient means against said holding means to constrict said resilient means around said drive shaft to establish a fluid-tight seal; and

resilient valve means having a reclosable slit and mounted within said holding means for receiving said drive shaft through said slit, said slit being closed when said drive shaft is removed from said valve means to establish said valve means as a fluid barrier.

5,062,649

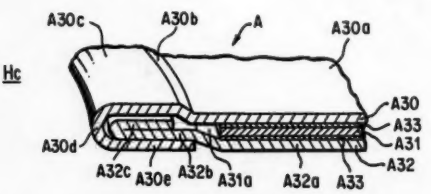
STEEL LAMINATE GASKET WITH WIDE SEALING AREA

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 243,528, Sep. 12, 1988. This application Jul. 2, 1990, Ser. No. 546,839

Int. Cl.[5] F16J *15/08*

U.S. Cl. 277—235 B **12 Claims**



1. A steel laminate gasket for an internal combustion engine having at least one hole therein, comprising,

a first plate having at least one first hole therein corresponding to the hole of the engine, said first plate including a base portion, at least one curved portion integrally formed with the base portion to extend transversely with respect to the base portion to surround and define the first hole, at least one flange integrally formed with the curved portion and located at a side of the base portion to extend substantially parallel to the base portion and surrounding the first hole, at least one side wall formed at one of the base portion and the flange, said side wall being spaced apart from the curved portion to surround the first hole, and an area around the first hole surrounded by the side wall and the curved portion for forming an embossed portion,

a second plate situated at a flange side of the first plate, said second plate having at least one second hole therein, the size of the second hole being larger than the size of the flange so that when the gasket is assembled, the flange is located inside the second hole, and

a third plate situated adjacent to the second plate and having a solid portion situated between the flange and base portion inside the embossed portion, distance between an outer surface of the third plate and an outer surface of the base portion of the first plate laterally outside the side wall being smaller than distance between outer surfaces of ht flange and the base portion laterally inside the side wall, thickness of the solid portion being greater than that of the third plate and thinner than an inner space between the flange and base portion inside the embossed portion so that when the gasket is tightened, the side wall deforms to seal thereat.

5,062,650

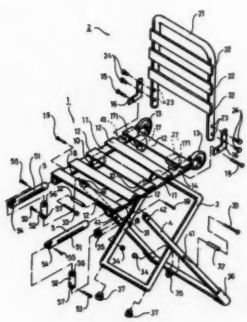
MULTI-FUNCTION CHAIR

C. I. Chang, 157-1, Hou-Hu, ChiaYi City, Taiwan

Filed Jan. 23, 1990, Ser. No. 469,018

Int. Cl.[5] A47C *13/00*

U.S. Cl. 297—129 **2 Claims**



1. A multi-function chair structure, comprising:

a seat comprising of two parallel round tubes and a plurality of parallel crosswise plates fixed on and extending between the parallel tubes, each tube having an open front end, a first pair of opposing pin holes at a rear end of said tube, a second pair of opposing pin holes adjacent the front end of the tube, a wheel on the rear end of each tube mounted on an axis perpendicular to the tube and a stop projection fixed under the seat at the rear end of said tube, and a bracket at approximately the longitudinal center of said tube;

a backrest comprising a U-shaped tube frame and a plurality of parallel crosswise plates fixed on the frame, each leg of said U-shaped frame having a third pair of opposing pin holes at lower ends of the limbs of said frames to attach said frame, by means of bolts through said third pin holes, to one leg of an L-shaped fastener, another leg of said fastener being attached to a corresponding said parallel tube by means of bolts though said tube's first pair of pin holes, whereby the seat is connected to the backrest;

a fore leg shaped as a rectangular frame, having a first shaft hole at approximately the longitudinal center of each of two side tubes of said fore leg;

a U-shaped hind leg, having a second shaft hole at approximately the longitudinal center of each of two side limbs of said hind leg so that a shaft tube may pass through both the first shaft holes of said fore leg and said second shaft holes of said hind leg, to affix the fore leg with the hind leg;

two extending tubes received respectively in the front ends of said round tubes, each extending tube having a straight slot for a pin received in said second opposing pin holes of a corresponding said parallel tube to pass through, and

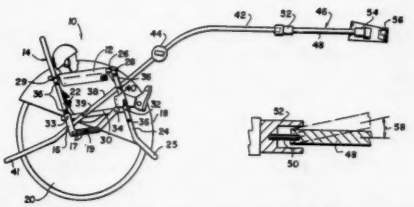
each having a fourth pair of opposing pin holes at a front end of said extending tube for a pin to connect with a linking member, said linking member attached on an opposite end to a corresponding free end of a limb of said hind leg, whereby said extending tubes are mounted for back and forth motion within said parallel tubes, to enable partial ingress into and egress out of the front end of each of said parallel tubes for the respective linking members and limbs of the hind leg, the legs being moveable between a first configuration for use of the structure as a chair in which the linking members are withdrawn from the front ends of said parallel tubes, the hind leg limbs and fore leg side tubes are angled relative to one another under the seat and a top tube of the fore leg engages said stop projection, and a second configuration for use of the structure as a truck supported on said wheels in which the linking members are inserted in the front ends of said parallel tubes, the limbs of the hind leg project coaxially from the front ends of said parallel tubes and the top tube of the fore leg engages said brackets with the fore leg side tubes being parallel to the hind leg limbs.

5,062,651

JOGGING BABY CARRIAGE

Michael J. Varieur, 25 Filors La., Stony Point, N.Y. 10980

Filed Aug. 10, 1990, Ser. No. 565,664
Int. Cl.[5] B62D *51/04*
U.S. Cl. 280—1.5 **11 Claims**



1. A carriage for receiving a child to be towed by a person during jogging and walking, comprising:

a frame;

at least two wheels rotatably mounted to said frame for rolling on the ground;

a seat for receiving a child connected to and supported by said frame;

torso engaging means adapted to be connected to a person to tow the carriage;

at least one tow bar having one end connected to said frame, and an opposite end; and

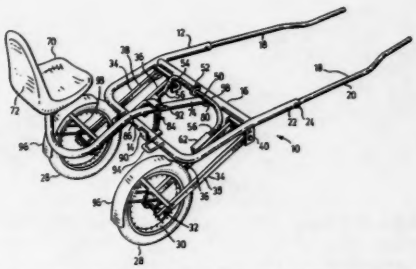
flexible motion suppression means connected between the opposite end of said tow bar and said torso engaging means for pulling said frame while suppressing the transmission of erratic vertical and horizontal movement from said torso engaging means to said frame, said motion suppression means comprises a suppression bar, a cut-shaped fitting connected to the opposite end of said tow bar, an axially extending flexible member connected to said flexible member being said fitting, said flexible member and an end of said suppression bar connected to said flexible member being positioned within said fitting for restricting a maximum angle of motion between said suppression bar and said tow bar in any direction around said fitting.

5,062,652

SULKY

Mervin G. Burke, R.R. #3, Chelmsford, Ontario P0M 1L0, Canada

Filed Mar. 7, 1989, Ser. No. 320,055
Claims priority, application Canada, Oct. 12, 1988, 580121
Int. Cl.[5] B62C *1/08*
U.S. Cl. 280—64 **13 Claims**



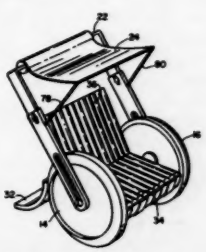
1. A sulky adapted for pulling by an animal comprising a rigid frame having a rear cross member and a pair of transversely spaced thills extending forwardly from the cross member, a driver's seat, means for mounting said seat on said rigid frame, a pair of transversely spaced, downwardly-extending wheel mounts having upper and lower ends and being pivotably connected at their upper ends to said rigid frame, a ground engaging wheel rotatively connected to the lower end of each of said wheel mounts, and a single torsion bar suspension means connected directly to both of said wheel mounts and said frame for yieldably supporting the frame on the two wheels.

5,062,653

MULTIPURPOSE RECREATIONAL CART

Janis W. Deglis, 612 North St., Feeding Hills, Mass. 01030, and Robert C. Amrich, 50 Shady Hill La., Glastonbury, Conn. 06033

Filed Nov. 14, 1989, Ser. No. 436,327
Int. Cl.[5] B62B *11/00*
U.S. Cl. 280—648 **5 Claims**



1. A multipurpose cart comprising a barrel shaped body having a circular cross-section and transversely opposed planar end portions, said body including a semi-cylindrical lower section having a rectangular top opening and a semi-cylindrical lid pivotally attached to the lower section, a pair of transverse axle pins extending through respective ones of said end portions, an inverted U-shaped handle having a pair of legs, a lower end of each leg being secured to a respective axle pin, a pair of wheels, each wheel extending between a respective one of said legs and end portions, and supported for rotation by a respective one of said axle pins, a chair including a planar seat portion and a planar backrest portion pivotally connected to the seat portion for movement between an extended use position and a folded storage position, and means on said lower

section for supporting said seat portion with said seat portion extending substantially along a plane formed by the opening in the top of said lower section, wherein the cart provides storage space within said lower section and said lid when said chair is in the folded position and the lid is pivoted to a closed position.

5,062,654

BUSH ASSEMBLY

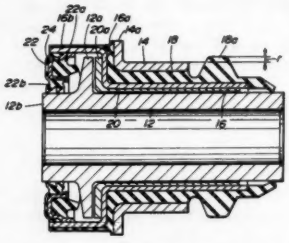
Toshihiko Kakimoto, and Takuya Murakami, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 259,819, Oct. 19, 1988, abandoned. This application Mar. 5, 1991, Ser. No. 666,480

Claims priority, application Japan, Oct. 19, 1987, 62-261773

Int. Cl.[5] F16F *1/38*

U.S. Cl. 280—673 **4 Claims**



1. A bush assembly used for fixing a first member having an essentially cylindrical opening to a second member, said bush assembly comprising:

an inner cylindrical member defining therein an essentially cylindrical space for supporting an elongated member which engages said second member;

an outer cylindrical member which engages said opening of the first member, the outer cylindrical member being arranged so that the axis thereof substantially coincides with that of said inner cylindrical member;

a rigid sleeve arranged between said inner and outer cylindrical members, said rigid sleeve having a greater inner diameter portion at one end thereof so as to form an annular space between the greater inner diameter portion and said inner cylindrical member;

an elastic member, one surface of which is fixed to said outer cylindrical member, and the other surface of which is fixed to said rigid sleeve, said elastic member having a radially extending projection which engages said opening of the first member, the outer diameter of said radially extending projection being greater than that of said outer cylindrical member;

a slipping member arranged between said rigid sleeve and said inner cylindrical member so that said rigid sleeve slidably engages said inner cylindrical member; and

a sealing member disposed in said annular space, a portion of which is fixed to one of said rigid sleeve and said inner cylindrical member, and another portion of which contacts the other of said rigid sleeve and said inner cylindrical member.

5,062,655

WHEEL SUSPENSION SYSTEM HAVING A LOWER BEARING WITH TWO BALL JOINTS

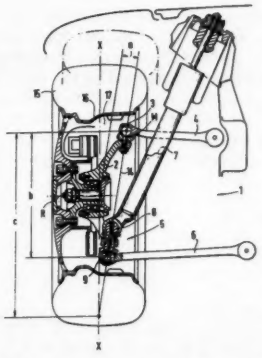
Karl Sommerer, Wiernsheim, Fed. Rep. of Germany, assignor to Dr.Ing.h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 6, 1990, Ser. No. 609,635

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1989, 3938475

Int. Cl.[5] B60G *7/00*

U.S. Cl. 280—674 **10 Claims**



1. A wheel suspension system, particularly a front-wheel suspension system for a motor vehicle, comprising: a wheel carrier; a spring strut; upper and lower wheel suspension members linked to said wheel carrier by upper and lower bearing elements and guiding said wheel carrier around a turning axis; said lower bearing element comprising at least two joints, said spring strut being supported in a hinged manner in a joint of said lower bearing element, and said turning axis extending through a center axis of said upper bearing element and through joints of the lower bearing element.

5,062,656

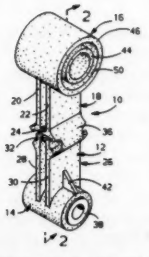
FLEXIBLE LINK ASSEMBLY FOR A VEHICLE SUSPENSION SYSTEM

Ernest J. Hynds; Keith A. Stowe, both of Saginaw, and David C. Cook, Frankenmuth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1990, Ser. No. 563,150

Int. Cl.[5] B60G *21/00, 11/22;* F16F *1/16*

U.S. Cl. 280—689 **7 Claims**



1. A flexible and resilient link assembly for connecting a control arm and a tubular stabilizer bar of a vehicle suspension system, the link assembly comprising:

(a) a jointed arm having first and second portions pivotal with respect to one another;

(b) a collar portion including an outer cylinder connected to the first portion of the arm and an inner cylinder concen-

trically mounted within the outer cylinder by a flexible annular wall for receiving the stabilizer bar;

(c) means for connecting the second portion of the arm to the control arm.

5,062,657

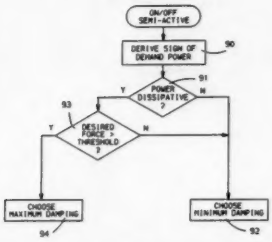
ON/OFF SEMI-ACTIVE SUSPENSION CONTROL

Kamal N. Majeed, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 430,856, Nov. 2, 1989, abandoned. This application Nov. 16, 1990, Ser. No. 614,813

Int. Cl.[5] B60G *17/08*

U.S. Cl. 280—707 **2 Claims**



1. A controlled suspension for a wheeled vehicle having a body suspended by at least one suspension spring on an unsprung, road contacting wheel, the suspension comprising, in combination:

a damper connected to apply a damping force between the body and wheel, the damper including apparatus providing a first mode of operation characterized by a high damping force and a second mode of operation having a low damping force and including a valve capable of switching the actuator between the first and second modes of operation at a frequency sufficient for control of resonant wheel vibrations; and

control means effective to repeatedly derive from one or more sensed vehicle suspension related operating variables, at the rate sufficient to control resonant wheel vibrations, a desired force to be applied between the body and wheel in order to produce a desired suspension behavior and to further determine for each such derivation whether the application of the desired force would result in active or dissipative suspension power, the control means being further effective to store a threshold and to control the valve for each such derivation so that (1) the damper operates in its second mode of operation when the desired force would produce active power, (2) the damper operates in its first mode of operation when the desired force exceeds the threshold and would produce dissipative power, and (3) the damper operates in its second mode of operation when the desired force is less than the threshold and would produce dissipative power.

5,062,658

VEHICLE SUSPENSION CONTROL WITH REAL TIME GAIN SWITCHING

Kamal N. Majeed, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 430,859, Nov. 2, 1989, abandoned. This application Nov. 16, 1990, Ser. No. 614,894

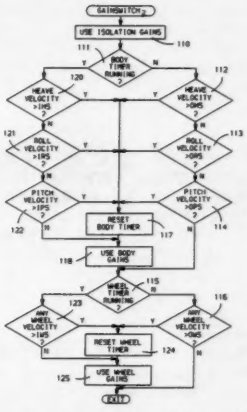
Int. Cl.[5] B60G *17/08*

U.S. Cl. 280—707 **7 Claims**

1. Suspension apparatus for a motor vehicle having a body suspended by suspension springs at a plurality of points on unsprung, road contacting wheels, the suspension comprising, in combination:

an actuator connected to exert a variable vertical force between the vehicle body and one of the wheels in response to a control signal;

a control effective to derive the control signal for the actuator from a linear combination of vehicle state variables derived from sensed vehicle variables, the linear combination being characterized by gains determining the relative contribution of each state variable to the control signal;



memory means storing a plurality of alternative sets of gains for use in deriving the control signal, each stored set of gains comprising gain values tending to produce a different suspension performance; and

the control having means responsive to one of the sensed vehicle variables in real time to select between the alternative sets of gains in deriving the control signal.

5,062,659

SUSPENSION APPARATUS OF A VEHICLE

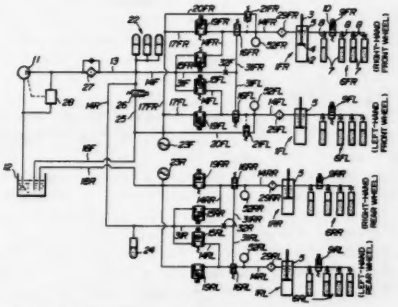
Takeshi Edahiro; Shin Takehara; Toshiki Morita, and Hiroyoshi Kumada, all of Horishima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 17, 1990, Ser. No. 466,666

Claims priority, application Japan, Jan. 17, 1989, 1-8143

Int. Cl.[5] B60G *11/27*

U.S. Cl. 280—707 **30 Claims**



1. A suspension apparatus of a vehicle, comprising:

a cylinder unit interposed between a sprung weight and an unsprung weight for changing a ride height by supplying or discharging an operating liquid;

a supply/discharge control valve for supplying to or discharging from the cylinder unit;

a supply/discharge control means for controlling supply of the operating liquid to or discharge of the operating liquid

from the cylinder unit by controlling the supply/discharge control valve on the basis of a predetermined condition;

a rebound detecting means for detecting a rebound of a wheel;

a pressure detecting means for detecting a pressure in the cylinder unit; and

a trouble detecting means for detecting that the supply/discharge control valve is operating outside of predetermined normal values when the pressure detected by the pressure detecting means is continued at a magnitude above a given value for a given period of time when the rebound detected by the rebound detecting is above a given value.

5,062,660

PRESSURE MEDIUM FLUID CIRCUIT FOR ACTIVE SUSPENSION SYSTEM WITH VARIABLE FLUID SOURCE DISCHARGE RATE DEPENDING UPON MAGNITUDE OF STROKE IN RELATIVE DISPLACEMENT BETWEEN VEHICULAR BODY AND SUSPENSION MEMBER

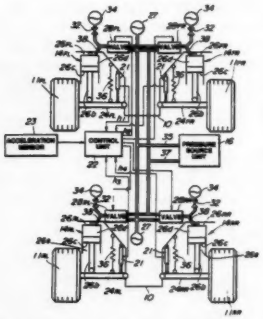
Masaharu Satoh; Naoto Fukushima; Yukio Fukunaga; Yohsuke Akatsu; Itaru Fujimura, and Kensuke Fukuyama, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Apr. 27, 1990, Ser. No. 515,891

Claims priority, application Japan, Apr. 28, 1989, 1-110626

Int. Cl.[5] B60G *11/26*

U.S. Cl. 280—707 **18 Claims**



1. A fluid supply system for an active suspension system for supplying fluid pressure for a hollow working cylinder via a pressure control valve for adjusting suspension characteristics in order to suppress a vehicular body attitude change of an automotive vehicle and absorb road shock vibration, said system comprising:

a pressurized fluid source unit for circulating pressurized fluid through a fluid circuit extending via said pressure control valve and said working cylinder;

sensor means for monitoring a relative displacement between a vehicular body and a suspension member rotatably supporting a road wheel for producing a relative displacement magnitude indicative signal;

first means for deriving a predicted fluid flow amount through said fluid circuit on the basis of said relative displacement magnitude indicative signal to produce a predicted fluid flow amount indicative signal;

second means for determining on the basis of said relative displacement magnitude indicative signal whether a magnitude of relative displacement is greater than or equal to a predetermined stroke criterion, so as to produce a large stroke indicative signal when said relative displacement magnitude is greater than or equal to said predetermined stroke criterion; and

third means for deriving an amount of fluid supplied from said pressurized fluid source unit on the basis of said predicted fluid flow amount for controlling said pressurized fluid source unit in such a manner as to adjust an amount of fluid flow supplied from said pressurized fluid source unit towards the fluid flow amount derived by said third means, said third means being responsive to said large stroke indicative signal for increasing the derived fluid flow amount.

5,062,661

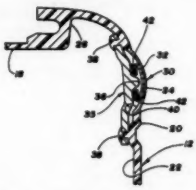
AUTOMOTIVE AIR BAG COVER HAVING A HORN SWITCH FORMED THEREIN

Larry J. Winget, 1799 Foxknoll, Leonard, Mich. 48038

Filed Jul. 20, 1990, Ser. No. 555,893

Int. Cl.[5] B60R *21/08*

U.S. Cl. 280—731 **5 Claims**



1. An automotive air bag cover comprising:

substantially rigid front cover and side panels adapted to enclose an uninflated automotive air bag, the front panel having inner and outer surfaces and being interconnected to the side panel at seams which permit the inflating air bag to leave the cover, the inflating air bag exerting a force at the inner surface of the front panel sufficient to cause the front panel to separate from the side panels along the seams; and

a horn switch device including a flexible manually operable diaphragm at the outer surface of the front panel, the diaphragm having a first electrically conductive inner surface for making a circuit path with a corresponding second electrically conductive inner surface upon manual actuation of the diaphragm, the second electrically conductive inner surface being defined by a rigid plate attached to the substantially rigid remainder of the front panel to move therewith wherein the first and second electrically conductive inner surfaces define a hollow compartment in the front panel and wherein upon separation from the side panels the front panel including the diaphragm, the hollow compartment and the rigid plate move together to permit the inflating air bag to leave the cover.

5,062,662

VEHICLE SEATBELT HAVING AN INTEGRAL AIRBAG

Robert W. Cameron, 1321 King St., Bellingham, Wash. 98226

Filed May 16, 1990, Ser. No. 524,161

Int. Cl.[5] B60R *21/18*

U.S. Cl. 280—733 **14 Claims**

1. A passenger restraint device mountable in a vehicle having a seat for seating at least one passenger, said restraint device comprising:

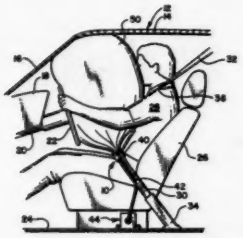
at least one safety belt for placement about said passenger in said seat, said safety belt having first and second ends anchorable to said vehicle and a middle portion configured to be positioned in front of said passenger;

an inflatable restraint bag for restraining motion of said passenger when inflated, said inflatable restraint bag being attached to said middle portion of said safety belt so that said inflatable bag is positioned in a selected location relative to said passenger when said safety belt is placed about said passenger;

a cylinder containing a compressed gas in an amount sufficient to inflate said restraint bag, said compressed gas cylinder having a neck portion having a bore for permitting said compressed gas to flow therethrough;

a conduit for conveying said compressed gas from said cylinder to said restraint bag, said conduit being attached to said neck portion of said compressed gas cylinder so that the interior of said conduit is continuous with said bore in said neck of said cylinder,

a lid positionable in said bore in a first position in which said bore is closed by said lid so as to prevent said compressed gas from flowing from said cylinder into said conduit, said lid having a recess in an edge thereof;



a hinge mounted to said edge of said lid and said neck of said cylinder so as to permit said lid to pivot about said hinge from said first position in which said bore is closed by said lid to a second position in which said lid is removed from said bore so as to permit said compressed gas to flow from said cylinder into said conduit;

an actuating rod having a first end which is positionable in said recess in said edge of said lid so as to maintain said lid in said closed position; and

means for withdrawing said first end of said actuating rod from said recess in response to an impact so that said lid pivots about said hinge from said first position to said second position so as to open said bore and permit said compressed gas to flow from said cylinder into said conduit.

5,062,663

MODULE COVER OF AIR BAG SYSTEM

Takeshi Satoh, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Aug. 27, 1990, Ser. No. 572,458

Claims priority, application Japan, Sep. 25, 1989, 1-248682

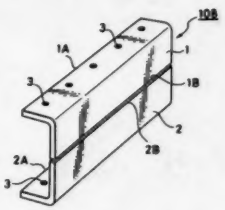
Int. Cl.[5] B60R *21/20*

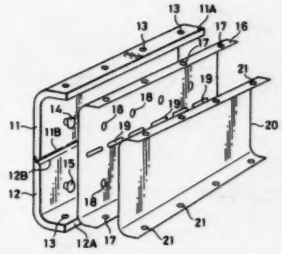
U.S. Cl. 280—743 **7 Claims**

1. A module cover adapted for covering a front opening of a case in which a folded air bag is confined and an inflator for providing gas to inflate and expand the air bag is disposed, comprising;

a pair of cut-in-half bodies each of which covers half of said front opening of said case and has a rear face and one edge, said one edge of one of said cut-in-half bodies contacting with one edge of the other of said cut-in-half bodies, edge portions of the cut-in-half bodies opposite to said one edges being attached to said case, at least one of said cut-in-half bodies having protrusions protruding from said rear face; and

a resin film disposed so as to stretch over the rear face of one of said cut-in-half bodies and the rear face of the other of said cut-in-half bodies, said resin film having holes in which said protrusions are inserted so that said film is engaged with the cut-in-half bodies, and when said inflator is not actuated, said film maintaining contact with the cut-in-half bodies and allowing engagement state between said cut-in-half bodies for making said cut-in-half bodies an integral module cover, and when said inflator is actuated and said air bag is expanded, said film permitting said engagement between said cut-in-half bodies to be released





and said one edges of said cut-in-half bodies to be opened so as to move away from said case.

5,062,664

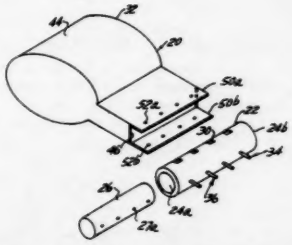
AIR BAG ASSEMBLY

Robert J. Bishop, Washington; Robert P. Fontecchio, Rochester Hills, and Daniel G. Zelenak, Jr., Rochester, all of Mich., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 11, 1989, Ser. No. 350,432

Int. Cl.[5] B60R *21/20*

U.S. Cl. 280—743 **47 Claims**



1. A device comprising the combination of a generally cylindrically shaped gas generator and an assembly, the assembly comprising:

a first member including a wall extending along a length dimension, and defining an opening, the first member being at least of partial cylindrical construction;

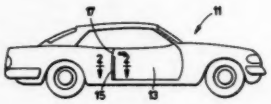
first means, including a first portion extending through the wall, and a second portion adapted to circumferentially envelope portions of the gas generator and to secure the gas generator to the first means positioned inboard from ends of the first member and ends of the gas generator.

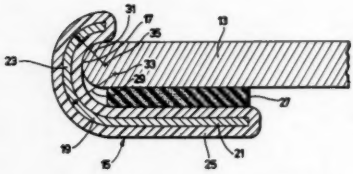
5,062,665

DOOR EDGE GUARD WITH J CROSS SECTION

Gerald R. Schotthoefer, Dallas, Tex., assignor to Adell Corporation, Sunnyvale, Tex.

Filed Jun. 11, 1990, Ser. No. 536,422
Int. Cl.[5] B60R *27/00*
U.S. Cl. 280—770 1 Claim





1. A door edge guard for protecting the trailing edge of an automobile door, the trailing edge being curved and having a specific radius of curvature, comprising:

a body having a straight portion parallel to an outer surface of the automobile door, and a curved portion extending from the straight portion around the, .trailing edge of the door, the curved portion having an outer surface with a first radius of curvature and a second radius of curvature, wherein the first and second radii have different centers, wherein the first radius of curvature is located between the straight portion of the body and the second radius of curvature, and the first radius of curvature is larger than the second radius of curvature;

a piece of double sided adhesive tape of predetermined thickness located between the outer surface of the door and the straight portion of the body for securing the body to the door; and

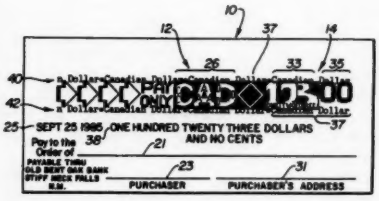
an insulating cover completely surrounding the body to prevent contact between the body and the door wherein the outer surface of the portion of the insulating cover located adjacent an inner surface of the second radius of curvature of said curved portion has a radius of curvature which corresponds to the radius of curvature of the trailing edge of the door for engagement therewith.

5,062,666

FINANCIAL INSTRUMENT AND METHOD OF MAKING

William H. Mowry, Dayton; James H. Schuelke, Vandalia, and Robert L. White, Franklin, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Feb. 1, 1990, Ser. No. 473,929
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—67 40 Claims



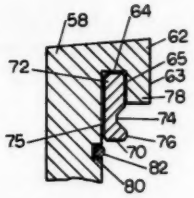
1. An international financial instrument comprising a face having a first area and a second area, a multi-letter international monetary code printed on said first area, an amount printed on said second area, said monetary code comprising a three letter code consisting of letters printed in a negative pattern and formed by a series of rows of printed dots to define an outline of each of said letters.

5,062,667

CONNECTION SEAL

Jack E. Miller, Houston; Joe R. Fowler, Spring; Stewart A. Fox, and Bryan Lane, both of Houston, all of Tex., assignors to National-Oilwell, Houston, Tex.

Filed Jan. 19, 1990, Ser. No. 467,600
Int. Cl.[5] F16L *15/04*
U.S. Cl. 285—381 16 Claims



1. A connection, comprising:

a first tubular member having a flow axis and an annular shoulder;

a second tubular member adapted for engagement with said first tubular member and having an annular sealing surface;

cooperable connection means disposed on said members for coupling said member;

said shoulder having an annular groove forming a first annular wall opposite and parallel a second annular wall, said first annular wall facing in the same direction as that of said annular sealing surface;

a metal seal ring shrink fitted onto said first annular wall of said annular groove and not onto said second annular wall; and

said metal seal ring sealingly engaging said annular sealing surface of said second tubular member thereby establishing a metal-to-metal seal between said members.

5,062,668

SAFETY LOCK FOR THE DOORS OF ELECTRICAL APPLICANCES

Oswald Onderka, and Fritz Krasser, both of Altdorf, Fed. Rep. of Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Apr. 11, 1990, Ser. No. 507,216
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 8904660
Int. Cl.[5] E05B *15/02*
U.S. Cl. 292—25 37 Claims

1. A safety door lock for a door of an electrical appliance to selectively enable or disable operation of the electrical appliance, comprising:

a longitudinally displaceable detent bolt mounted in a door of an appliance, said detent bolt including a free end having a detent recess;

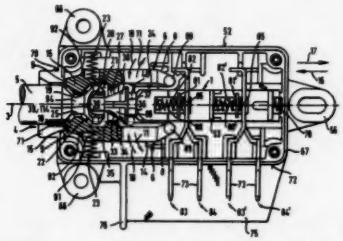
a door lock housing having an opening adapted for receiving said free end of said detent bolt;

a switching slide which is longitudinally displaceable along a longitudinal axis and which is mounted in the door lock housing, the switching slide being oriented such that longitudinal displacement of the detent bolt toward the switching slide brings the detent bolt into engagement with the switching slide, said switching slide having a stub end adapted to engage with the free end of the detent bolt;

after engagement of the end of the detent bolt with the stub end of the switching slide, further longitudinal displacement of the detent bolt in a direction toward the switching slide causing movement of the switching slide in an "on" direction to its "on" position;

a biasing means for urging the switching slide in an "off" direction toward an "off" position in which the appliance is disabled;

a detent means for latching the free end of the detent bolt in a locking position within the door lock housing upon insertion of the detent bolt in the door lock housing and for locking the switching slide in its "off" position when the end of the detent bolt is not inserted in the door lock housing; the detent means including at least one releasable



locking latch which clamps the stub end of the switching slide in the "on" position of the switching slide, to prevent longitudinal movement of the switching slide; said at least one locking latch being movable in a direction which is generally radial to the longitudinal axis; means for biasing the latch carriers toward the longitudinal axis;

said at least one locking latch having a first portion which, in the "on" position of the switching slide, engages the detent recess in the free end of the detent bolt to retain the detent bolt within the door lock housing, and having a second portion which, in the "off" position of the switching slide, engages the stub end of the switching slide to retain the switching slide against longitudinal movement toward the "on" position.

5,062,669

SECURED LOCKING DEVICE

Donald P. McManigal, 12931 S. Meade, Palos Heights, Ill. 60463; David G. Yaksic, 14922 West Ave., Orland Park, Ill. 60462, and John McHugh, 5437 S. Menard, Chicago, Ill. 60638

Continuation of Ser. No. 331,089, Mar. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 946,783, Dec. 29, 1986, abandoned. This application Jul. 16, 1990, Ser. No. 554,941

Int. Cl.[5] E05C *5/02*

U.S. Cl. 292—60 **15 Claims**

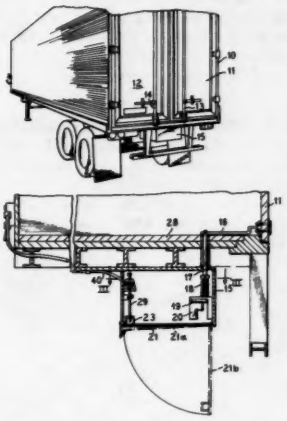
1. A lock mechanism for licking the rear doors of a trailer-tractor having support members secured to the floor of the trailer comprising:

a tamper-proof enclosure secured to the support members below the floor and generally between and behind at least one rear wheel of the trailer for preventing unauthorized access to said lock mechanism from outside the trailer, said enclosure including a rotatably secured panel member;

a manually operable locking mechanism for locking at least one trailer rear door including an actuating rod extending through the floor to the interior of the trailer and operatively connected to a door locking arrangement in an interior portion of the trailer and a handle located with said tamper-proof enclosure secured to said actuating rod;

means for receiving air pressure; and

a latch mechanism operatively connected to said air pressure receiving means and contained within said tamper-proof enclosure effective to selectively permit said panel to



rotate downwardly in response to gravity to provide access to said handle.

5,062,670

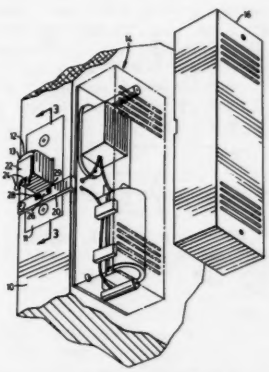
LOCK MONITOR

Emanuel Grossman, 1555 Finch Ave. E., Suite 1105, Willowdale, Canada

Filed Oct. 23, 1990, Ser. No. 601,648

Int. Cl.[5] E05C *1/112;* **H01H** *27/00*

U.S. Cl. 292—137 **12 Claims**



1. A lock monitor for fitting to lockable objects that have locks that incorporate a bolt mechanism including a slidable bolt having an engaging face at the free end thereof and a mortise, where the opening of said mortise is larger in at least one dimension than said engaging face of said slidable bolt, said lock monitor comprising:

an electrically operated status indicator;

an actuating arm attachable to the engaging face of said slidable bolt, where said actuating arm extends generally perpendicular to the direction of movement of said slidable bolt;

a contact plate attachable to said bolt mechanism adjacent to said engaging face of said slidable bolt; and first and second circuit contacts located on said contact plate, said first and second circuit contacts being connected in a circuit monitored by said status indicator, with said first and

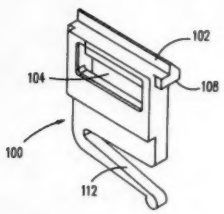
second circuit contacts being separated and insulated from each other such that said circuit remains open until the separation between said first and second circuit contacts is bridged by engagement with said actuating arm when said slidable bolt is disengaged from said mortise, said engagement between said actuating arm and said first and second circuit contacts causing said status indicator to register a change in status of said lock.

5,062,671

DOOR LATCH FOR A COMPUTER HOUSING

Frederick E. Goetz, Niceville; Michael S. Miller, Delray Beach, both of Fla., and Homer Shelton, Jr., Lexington, Ky., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 5, 1990, Ser. No. 609,298
Int. Cl.[5] E05C *1/08*
U.S. Cl. 292—175 **8 Claims**



1. A door latch assembly, comprising in combination:
a door including a latch pocket, said latch pocket includes a first aperture in a first surface of said pocket, and a second aperture in a second surface of said pocket, said second surface opposing said first surface;
a slidable latch positioned in said pocket of said door, said latch including the following parts: a catch; means for receiving a force for sliding said latch in a first direction, said force receiving means is positioned in said first aperture of said pocket; means for retaining said latch in said pocket and for limiting the travel of said latch in a second direction opposite said first direction, said means for retaining is positioned in said second aperture of said pocket; and a spring for applying a force to said latch in said second direction.

5,062,672

COPY MACHINE REMOVER OF PAPER CLIPS AND STAPLES

James I. Harris, 440 W. 47th St. #5-F, New York, N.Y. 10036

Filed Dec. 13, 1990, Ser. No. 626,731
Int. Cl.[5] B25J *15/06*
U.S. Cl. 294—65.5 **19 Claims**

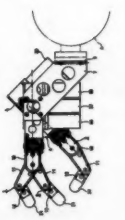
1. A copy machine paperclip and staple retrieval device comprising as a combination: a substantially rigid axially elongated member elongated along a longitudinal axis thereof having opposite proximal and distal ends thereof, said elongated member having a first cross-sectional area extending transversely across said longitudinal axis in juxtaposition to said proximal end and the cross-sectional area of said elongated member diminishing from said first cross-sectional area to a diminished cross-sectional area at said distal end, a permanent magnet having a transverse second cross-sectional area smaller than said diminished cross-sectional area of said distal end, and a cap member having a bottom end and a top open end and having an inner space in through-communication with the top open end and of a size and shape having the permanent magnet seated within the inner space, and said open end being of a size having said distal end received therein and the cap member being secured onto said distal end, said cap member mounted thereon having a sufficiently small third cross-sectional area as to be maneuverable within small spaces between copy machine inner parts whereby metallic debris is accessible to be attracted and held by the permanent magnet to and removed by withdrawal of said elongated member, said bottom end having an outer side surface substantially columnar in shape with a substantially blunt outer bottom surface having rounded edges such that no sharp corners or sharp edges exist thereby being devoid of danger of scratching or marring sensitive or soft surfaces of copy machine inner parts.

5,062,673

ARTICULATED HAND

Nobuharu Mimura, Aichi, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 28, 1989, Ser. No. 458,346
Claims priority, application Japan, Dec. 28, 1988, 63-332683
Int. Cl.[5] B66C *1/10*; B25J *15/02*
U.S. Cl. 294—111 **9 Claims**



1. An articulated hand comprising:
a plurality of finger module structures each of which has a top end provided with an abutting member for contacting an object and an other end connected to a finger connecting member and has a plurality of articulates formed between said top end and said other end by a plurality of link members rotatably mounted on articulate turn-shafts so that said articulates are capable of being bent and stretched both in a first direction vertical to the longitudinal direction of said finger module structure and in a second direction perpendicular to said first direction;
a plurality of motors provided at said other end of each of said finger module structures integrally therewith in a manner so as to give torque to said link members through power transmitting means to thereby freely bend and stretch said link members independently of each other; and
a hand structure connected to a manipulator so as to arrange at least one of said finger module structures in opposition

to at least one other of said finger module structures and so as to change a distance between said finger module structures in opposition to each other through the operation of said motors to bring said finger structures into contact with said object; wherein

said finger module structures are arranged in a manner so that said articulate turn-shafts are driven independently of each other,

each of said link members is provided with sensors respectively for directly detecting a relative angle and a relative torque between adjacent link members, and

independent angle-torque servo systems are provided for each of said articulate turn-shafts for comparing said relative angle and torque directly detected by said angle and torque sensors with a desired value thereof and processing resultant deviation signals therebetween; and

wherein each of said motors is connected to a variable constant-current source to change its power through changing an instruction current value and wherein values of motor revolution speed obtained from driving voltages of said motors are respectively fed back to servo systems to thereby correct said instruction current values so that damping may be applied to said angle-torque servo systems.

5,062,674

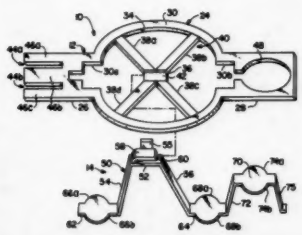
HAND TABLE AND CARRYING RACK

Charles Magee, Route 3, Box 895, Fort Valley, Ga. 31030

Filed Nov. 16, 1989, Ser. No. 437,091

Int. Cl.[5] A47G *23/06*

U.S. Cl. 294—143 **11 Claims**



1. A hand table for carrying a plate and a cup, comprising:

an upper support having a generally circular plate support and a cup opening; and

a lower support coupled to said upper support, said lower support having

a generally inverted U-shaped handle portion with a bight and first and second legs depending from said bight,

first and second foot members extending outwardly from free ends of said first and second legs, respectively, and

a cup support extending outwardly from said first foot member to a position directly below said cup opening.

5,062,675

ATV GUARD APPARATUS

Buddy Rhoden, Rte. 2, Box 142-C, and John Singletary, Rte. 2, Box 77C, both of Ochlocknee, Ga. 31773

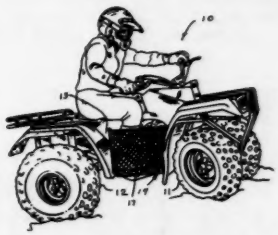
Filed Oct. 15, 1990, Ser. No. 597,500

Int. Cl.[5] B62J *25/00*

U.S. Cl. 296—1.1 **6 Claims**

1. An ATV guard apparatus for securement to a vehicle, including forward and rear wheel members, wherein the apparatus is secured to the vehicle between the forward and rear wheel members to overlie a leg compartment of the vehicle, wherein the apparatus comprises,

a first framework, the framework mounting a convex shield coextensively overlying and substantially upwardly extending relative to the first framework, the first framework further including a horizontal base plate, the horizontal base plate including mounting plate secured thereto, the mounting plate including a mounting plate



slot longitudinally arranged relative to the mounting plate for securement to the vehicle.

5,062,676

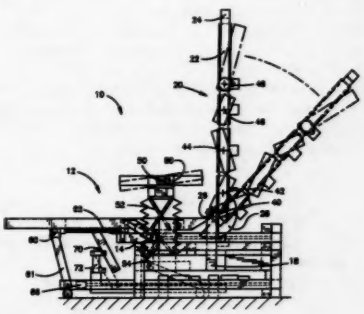
ADJUSTABLE CHAIR

Suzanne P. Mars, 23649 Duffield Rd., Shaker Hts., Ohio 44122

Filed Apr. 16, 1990, Ser. No. 509,463

Int. Cl.[5] A47C *1/02*

U.S. Cl. 297—338 **14 Claims**



1. An adjustable chair, comprising:

a base having a pair of spaced, parallel, forwardly extending frame members;

a vertically extending frame connected to, and projecting upwardly from, the base, the vertically extending frame having a pair of spaced, generally parallel uprights;

a seat connected to the base and disposed intermediate the frame members, the seat being vertically adjustable and pivotable about a laterally extending horizontal axis;

first and second arm rests connected to the frame members and disposed on either side of the seat and oriented parallel to the frame members, each of the arm rests being vertically adjustable and pivotable about a laterally extending horizontal axis;

a first, lower back rest extending between and connected to the uprights, the first back rest being pivotable about a laterally extending horizontal axis;

a second, middle back rest extending between and connected to the uprights, the second back rest being disposed at a vertical elevation above the first back rest, the second back rest being pivotable about a laterally extending horizontal axis; and

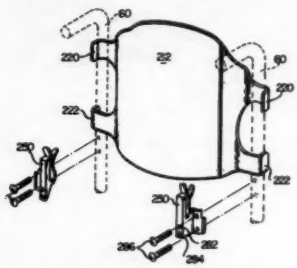
a third, upper back rest extending between and connected to the uprights, the third back rest being disposed at a vertical elevation above the second back rest, the third back rest being pivotable about a laterially extending horizontal axis.

5,062,677

WHEELCHAIR BACK SYSTEM

Eric C. Jay, Boulder, and Michael H. Nordquist, Louisville, both of Colo., assignors to Jay Medical, Ltd., Boulder, Colo.

Continuation of Ser. No. 7,272,137, Nov. 16, 1988, abandoned.
This application Nov. 1, 1990, Ser. No. 607,552
Int. Cl.[5] A47C 7/42
U.S. Cl. 297—444 9 Claims



1. A wheelchair back system removably affixable to vertical wheelchair posts, said wheelchair back system comprising:

a shell and a pair of post clips;

said shell having an upper channel and a lower channel on each side, said upper channels being vertically aligned with the lower channels on the corresponding side, one of said channels on each side being open to the rear and the other of said channels on each side being open to the front, whereby said channels are adapted to engage vertical wheelchair posts;

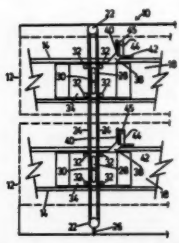
said post clips being affixed to the rear side of vertical wheelchair posts, said clips adapted to releasably engage said front opening channels and to secure said channel in engagement with said wheelchair post.

5,062,678

FLEXIBLE ANTI-TIPPING MECHANISM

Florian Westwinkel, Toronto, Canada, assignor to Pundra Indostries Limited

Filed Feb. 28, 1991, Ser. No. 662,015
Int. Cl.[5] E05C 7/06
U.S. Cl. 312—221 19 Claims



1. A drawer interlock associated with drawer slides for use in association with a stack of vertically stacked drawers, each drawer being withdrawable from and retractible into the stack and rearrangeable in its vertical location in the stack, each drawer slide having at least an inner slide member attachable to the drawer and an outer slide member attachable to a frame for the stack, the interlock comprising:

an elongate flexible member mountable on the frame to extend over at least the height between drawer slides the flexible member being deflectable between slack and taut positions;

an actuating member rotatably attached to each outer slide member to be rotatable between first and second positions and located with respect to the flexible member such that, in the first position, the flexible member is in its slack position and, in the second position, the flexible member is deflected into its taut position, the flexible member having a length such that when any one actuating member is deflected into its second position the flexible member in its corresponding taut position restricts movement of any other actuating member into its second position;

means associated with the inner slide member to rotate the actuating member into its second position on withdrawal of the respective drawer from the stack and to rotate the actuating member into its first position on retraction of the respective drawer into the stack;

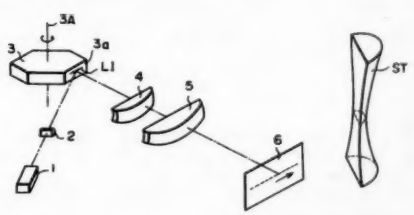
at least one guide associated with the drawer slide configured to confine deflection of the flexible member, within a prechosen height on rotation of the respective actuating member into its second position.

5,062,679

Fθ LENS SYSTEM IN OPTICAL SCANNER

Akihisa Itabashi, Mitaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 4, 1990, Ser. No. 461,020
Claims priority, application Japan, Jan. 13, 1989, 1-6473
Int. Cl.[5] G02B 26/08, 3/04
U.S. Cl. 359—206 8 Claims



1. An fθ lens system in an optical scanner in which a light beam from a light source is formed as a line image extending in a main scanning corresponding direction and is deflected at an equal angular velocity by a rotary polygon mirror having a reflecting face in the vicinity of an image forming position of the line image and is then formed by an image forming lens system in the shape of a spot on a scanned face to optically scan the scanned face, said fθ lens system focusing and forming the light beam deflected by the rotary polygon mirror as an image on the scanned face, said fθ lens system having a function for connecting a reflecting position of the rotary polygon mirror and the scanned face in an approximately conjugate relation with respect to a secondary scanning direction, and having an fθ function with respect to a main scanning direction, said fθ lens system comprising two groups of first and second lenses sequentially arranged from the side of the rotary polygon mirror toward the scanned face side,

said lenses having first to fourth lens faces provided from the side of said rotary polygon mirror and having shapes on a deflecting plane sequentially composed of an arc, a straight line, a straight line and an arc from the first to fourth lens faces, said first and second lenses respectively

having negative and positive refracting powers on a plane parallel to the deflecting plane,

said first to fourth lens faces being respectively constructed by a saddle type toric face having a radius of curvature on the deflecting perpendicular plane increased as this face is separated from an optical axis, a planar face, a concave cylindrical face having a refracting power on only the deflecting perpendicular plane, and a convex toric face having a large curvature on the deflecting perpendicular plane,

a combined focal distance fs on the deflecting perpendicular plane, radii of curvature r_1', r_3' and r_4' corresponding respectively to said first, third and fourth lens faces on the deflecting perpendicular plane satisfying the following condition,

$$2.20<\{(1/r_1')+(1/r_3')-(1/r_4')\}\cdot fs<3.51.$$

5,062,680

PLATE PLASTICS OPTICAL WAVEGUIDE

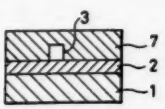
Saburo Imamura, Mito, and Tatsuo Izawa, Musashino, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 586,984

Claims priority, application Japan, Sep. 27, 1989, 1-249180

Int. Cl.[5] G02B *6/00;* **C08F** *14/14;* **B32B** *9/04;* **G03G** *15/04*

U.S. Cl. 385—131 **20 Claims**



1. A plate plastics optical waveguide, comprising:

a substrate;

a lower clad portion made of a first polymer and provided on said substrate;

a core portion made of a homopolymer or copolymer of dueterated or halogenated acrylates or deuterated or halogenated siloxanes provided on said lower clad portion; and

an upper clad portion made of said first polymer, said upper clad portion being provided on said core portion and surrounding said core portion together with said lower clad portion.

5,062,681

SLOT-COUPLING OF OPTICAL WAVEGUIDE TO OPTICAL WAVEGUIDE DEVICES

Robert J. Furmanak, Wilmington, Del.; Bruce L. Booth, West Chester, and Thomas K. Foreman, Sayre, both of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1990, Ser. No. 521,056

Int. Cl.[5] G02B *6/24*

U.S. Cl. 385—50 **33 Claims**

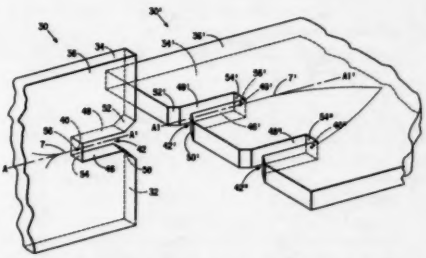
8. An optical waveguide device adaptable to be connected to a matching similar optical waveguide device, comprising:

a terminal edge;

a first pair of opposite external surfaces, substantially parallel to each other, and extending away from the terminal edge; and

a waveguide positioned equidistantly between the first pair of the opposite external surfaces, and having an end point and a center axis, the center axis forming an angle greater than zero with the terminal edge;

the device also having a through-slot extending in a direction substantially parallel to the guiding direction of the waveguide, the through-slot starting at the terminal edge and extending within the device so as to meet the end of the waveguide, the through-slot having a center axis coinciding with the center axis of the waveguide, the through-slot confined by a second pair of opposite side surfaces, substantially parallel to each other and to the center axis of the waveguide, and substantially perpendicular to the first pair of surfaces with the requirement that the width of the through-slot is substantially the same as the thickness of the matching device, and



an internal surface meeting with and being substantially perpendicular to the first and the second pairs of surfaces, the internal surface having a center point, the center point coinciding with the end of the waveguide,

so that when the through-slot of the optical waveguide device is coupled with a similar slot of a second similar device, the ends of the respective waveguides come in contact, and the center axes of the waveguides substantially coincide.

5,062,682

CONNECTOR FOR AN OPTICAL FIBER

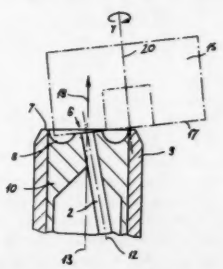
Silvio Marazzi, Cavigliano, Switzerland, assignor to Diamond S.A., Switzerland

Filed Sep. 20, 1990, Ser. No. 585,188

Claims priority, application Switzerland, Oct. 2, 1989, 3575/89

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—85 **8 Claims**



1. An optical connector comprising an optical fiber and a pin surrounding and supporting the fiber, the pin and the fiber having respective longitudinal axes and respective end surfaces, the improvement wherein the end surface of the connector pin comprises

an inner portion inclined relative both to the axis of the pin and to the axis of the fiber, said inner portion containing the entire end surface of the fiber and being flush therewith, and

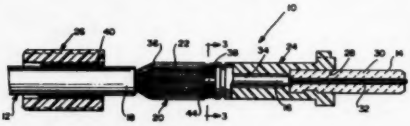
a peripheral portion completely surrounding said inner portion, the peripheral portion being orthogonal to the pin axis, said inner portion being completely separated from said peripheral portion by an annular indentation.

5,062,683

STRAIN RELIEF CONNECTOR FOR OPTICAL FIBER

Igor Grois, and Mark Margolin, both of Lincolnwood, Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 9, 1990, Ser. No. 549,872
Int. Cl.[5] G02B 6/26, 6/36
U.S. Cl. 385—87 14 Claims



1. An optical fiber connector for terminating and providing strain relief on an optical fiber cable having an inner fiber, an outer jacket and longitudinal strength material therebetween, comprising:

a housing having a rear input end into which the fiber, stripped of the outer jacket, extends and a front termination end, the rear input end being externally threaded and about which the longitudinal strength material is positionable; and

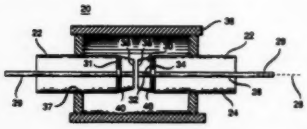
an internally threaded strain relief member through which the cable extends, the strain relief member being threadable onto the externally threaded rear input end of the housing to clamp the longitudinal strength material therebetween.

5,062,684

OPTICAL FIBER FILTER

Jane B. Clayton, Suwanee, and Calvin M. Miller, Atlanta, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 17, 1990, Ser. No. 466,536
Int. Cl.[5] G02B 6/38
U.S. Cl. 385—27 20 Claims



1. An optical filter which is capable of having a desired bandwidth, said filter comprising:

a first ferrule assembly having aligned passageway portions for receiving a length of optical fiber in one portion and another length in another portion thereof, the passageway portions being spaced apart by a mirror which is transverse to a longitudinal axis of the passageway portions and which is substantially closer to one end of said first ferrule assembly than to an opposite end thereof;

a second ferrule assembly having aligned passageway portions for receiving a length of optical fiber in one portion thereof and another length in another portion thereof, the passageway portions in said second ferrule assembly being spaced apart by a mirror which is transverse to a longitudinal axis of said passageway portions in said second ferrule assembly, and which is substantially closer to one end of said second ferrule assembly than to an opposite end thereof;

optical fiber positioned in each passageway portion of each ferrule assembly; and

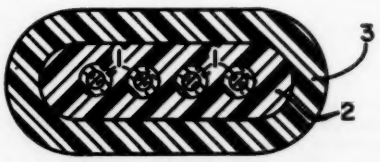
means for holding said first and second ferrule assemblies with the axes of the passageways aligned and with said one end of said first ferrule assembly being adjacent to said one end of said second ferrule assembly and for causing adjacent one ends of the ferrule assemblies to have a predetermined axial spacing.

5,062,685

COATED OPTICAL FIBERS AND CABLES AND METHOD

Michael B. Cain; Robert B. Desorcie, both of Corning; Rengan Kannabiran, Big Flats; Gitimoy Kar, Painted Post, and Eric H. Urruti, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 11, 1989, Ser. No. 419,674
Int. Cl.[5] G02B 6/44
U.S. Cl. 350—96.23 15 Claims



1. An optical communication medium comprising one or more optical fibers in a multilayer polymer coating, wherein the multilayer coating includes a textured polymer outer layer and at least one soft buffer layer positioned between the textured polymer outer layer and the glass optical fiber, and wherein:

the buffer layer comprises a low T_g polymer having a glass transition temperature not exceeding about −50° C.; and

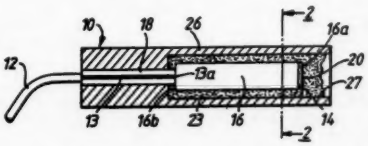
the buffer layer has a layer thickness at least sufficient to maintain thermally induced microbending loss in the communication medium below about 0.05 db/km at operating temperatures in the range of 0° C. to −60° C.

5,062,686

OPTICAL SENSORS AND OPTICAL FIBRE NETWORKS FOR SUCH SENSORS

Ross Barrow, Noble Park North; Martin C. Elias, O'Connor; Peter R. A. Lyons, Kaleen; Peter G. Jacob, Gilmore, and Scott C. Rashleigh, Wanniassa, all of Australia, assignors to Commonwealth of Australia, Australian Capitan Territory, Australia

PCT No. PCT/AU87/00399, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO88/04065, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 26, 1987, Ser. No. 259,120
Claims priority, application Australia, Nov. 27, 1986, PH9203/86
Int. Cl.[5] G02B 6/02, 6/16
U.S. Cl. 385—33 24 Claims



1. An optical sensor comprising:

elongate light transmission means;

lens means of at least substantially half-pitch length, positioned with one of its focal planes substantially at a mouth of the light transmission means to receive and focus a diverging cone of light emergent therefrom;

reflector means substantially at another focal plane of said

lens means to reflect said focused light back to said mouth of the light transmission means; and

detection means in the path of said light between said mouth and said reflector means, said detection means being responsive to an external condition to influence said diverging cone of light.

5,062,687

CARBON COATING OF OPTICAL FIBRES

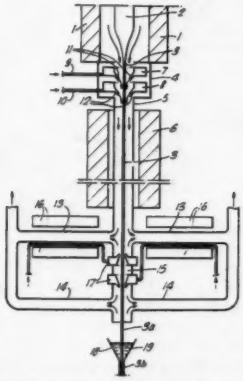
Gary S. Sapsford, Bishop's Stortford, Great Britain, assignor to STC PLC, London, England

Filed May 31, 1990, Ser. No. 531,859

Claims priority, application United Kingdom, May 31, 1989, 8912470

Int. Cl.[5] G02B *6/16*

U.S. Cl. 350—96.30 7 Claims



1. A method of providing a glass fibre with a vitreous carbon coating, which coating is formed principally by the pyrolysis of propadiene.

4. A vitreous carbon coated optical fibre made by the method claimed in claim 1.

5,062,688

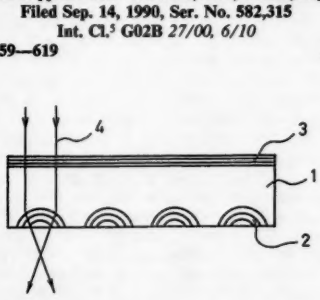
FLAT PLATE OPTICAL ELEMENT AND METHOD FOR PREPARING THE SAME

Eiji Okuda, and Hiroyuki Nemoto, both of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Sep. 14, 1990, Ser. No. 582,315

Int. Cl.[5] G02B *27/00, 6/10*

U.S. Cl. 359—619 9 Claims



1. A flat plate optical element comprising an optical element with a predetermined pattern formed by ion diffusion from a restricted region within a flat substrate, wherein an ion diffusion layer having a uniform thickness is formed with the same ions as those used for forming said optical element on the whole surface of the substrate opposite to the surface on which said optical element is formed, and wherein the volume ratio of the total volume of said optical element to the total volume of said diffusion layer is from 50 to 150%.

5,062,689

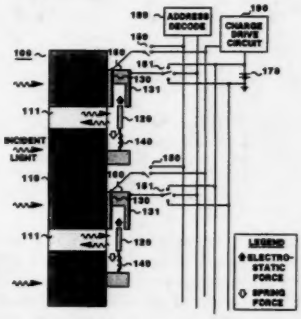
ELECTROSTATICALLY ACTUATABLE LIGHT MODULATING DEVICE

Dale R. Koehler, 1332 Wagontrain Dr., Albuquerque, N. Mex. 87123

Filed Aug. 21, 1990, Ser. No. 570,539

Int. Cl.[5] G02B *26/02*

U.S. Cl. 359—230 16 Claims



1. An electrostatically actuatable light modulating device comprising:

a substrate plate patterned with an array of light passing apertures; and,

a co-located array of shuttering cells to spatially control light transmission through the aperture array, each of the cells comprising:

a mechanically positionable shutter means;

an electrostatic field actuator means to forcibly move the shutter means;

a position dependent mechanical restoring force means acting on said shutter means and in opposition to said electrostatic field actuator means; and,

an electrical switch element means which is uniquely addressable within the array, to provide electrical energy to said electrostatic field actuator means.

5,062,690

LIQUID CRYSTAL DISPLAY WITH REDUNDANT FETS AND REDUNDANT CROSSOVERS CONNECTED BY LASER-FUSIBLE LINKS

Nathan R. Whetten, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 30, 1989, Ser. No. 373,433

Int. Cl.[5] G02F *1/133;* H01L *29/68;* G09G *3/36*

U.S. Cl. 359—59 14 Claims

5. A liquid crystal display, comprising:

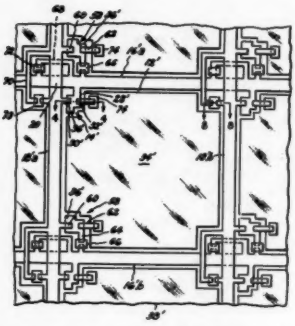
a plurality of cells arranged in an array of rows and columns;

a plurality of electrically conductive scan lines formed from a first electrically conductive layer, at least one scan line for transmitting electrical signals to each row of cells;

a plurality of electrically conductive data lines formed from a second electrically conductive layer, at least one data line for transmitting electrical signals to each column of cells, each scan line crossing each data line at a different crossover location at which that scan line is insulatively spaced from the data line to be crossed by at least a first section of insulation material;

at least one redundant scan line crossover means formed from at least a portion of said first conductive layer, each located at a different one of said crossover locations, for electrically bypassing that one crossover location when an associated one of said plurality of scan lines is electrically

aborted to an associated one of said plurality of data lines at that one crossover location and said one of said plurality of scan lines has been severed at a location encompassed by said redundant scan line crossover means; and at least one redundant data line crossover means formed at least a portion of said second conductive layer, each lo-



cated at a different one of said crossover locations, for electrically bypassing that one crossover location when an associated one of said plurality of scan lines is electrically shorted to an associated one of said plurality of data lines at that one crossover location and said one of said plurality of data lines has been severed at a location encompassed by said redundant data line crossover means.

5,062,691

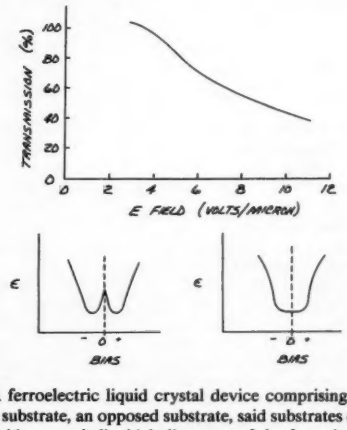
LIQUID CRYSTAL DEVICE WITH GREY SCALE

Miguel G. Tristani-Kendra, and George Papapolymerou, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 428,241, Oct. 27, 1989, abandoned. This application Aug. 3, 1990, Ser. No. 562,465

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—56 **9 Claims**



1. A ferroelectric liquid crystal device comprising a transparent substrate, an opposed substrate, said substrates disposed to provide a non-helicoidal alignment of the ferroelectric liquid crystal material, a ferroelectric liquid crystal material disposed between said substrates and electrodes on said substrates to define one or a plurality of pixels, each said pixel exhibiting controlled continuously variable light transmission as a function of applied field and wherein the molecular orientation of the liquid crystal material is continuously variable and controllable.

5,062,692

EXPOSURE APPARATUS

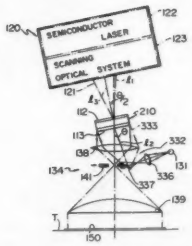
Masatoshi Marui, Saitama; Tomonori Inage, Tokyo; Yuji Matsui, Kawagoe, and Tazuko Ishizuka, Urawa, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 249,764, Sep. 26, 1988. This application Nov. 21, 1990, Ser. No. 616,385

Claims priority, application Japan, Sep. 24, 1987, 62-239832; Jun. 14, 1988, 63-146134

Int. Cl.[5] G02F *1/13*; G03B *23/14*

U.S. Cl. 359—45 **22 Claims**



1. An exposure apparatus for exposing a subject with an optical image, comprising:

a thermally-written liquid-crystal light valve having accommodated therein a liquid crystal layer;

means for emitting an optical writing heat spot directed onto said liquid-crystal light valve, said optical writing heat spot being reciprocatively movable in an X direction, either said liquid-crystal light valve or said emitting means being movable relative to each other to cause said heating spot to write a predetermined pattern into said liquid-crystal light valve; and

an optical projection system having a light source, a first optical means arranged between said light source and said liquid-crystal light valve for transmitting a first luminous flux that is emitted from said light source, through said liquid crystal layer formed into said predetermined pattern, and second optical means arranged between said liquid-crystal light valve and said subject for bringing a luminous flux transmitted through said liquid crystal layer to a substantially telecentric second luminous flux and for illuminating said subject with said second luminous flux, whereby said subject is exposed to an optical image corresponding to said predetermined pattern formed in said liquid crystal layer, wherein said liquid-crystal light valve has two opposite sides, one opposite side of which faces towards said writing optical means and a second opposite side that faces said subject, said writing optical means directing said heating light spot onto said one side of said liquid-crystal light valve, said first optical means of said projecting optical system making said first luminous flux incident upon said second side of said liquid-crystal light valve in such a manner that said first luminous flux is transmitted twice through said liquid-crystal layer formed into said predetermined pattern, said first optical means including a total reflecting mirror that is arranged at a location that is out of an optical axis of said second optical means so as to make said first luminous flux incident upon said second side of said liquid-crystal light valve in such a manner that an optical axis of said first luminous flux is inclined at a predetermined angle with respect to the optical axis of said second optical means, said liquid-crystal light valve being inclined such that a normal line to said one side of said liquid-crystal light valve defines an

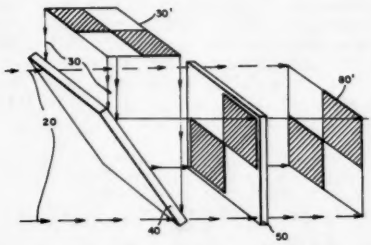
angle with respect to the optical axis of aid second optical means that is half said predetermined angle.

5,062,693

ALL-OPTICAL PHOTOCHROMIC SPATIAL LIGHT MODULATORS BASED ON PHOTOINDUCED ELECTRON TRANSFER IN RIGID MATRICES

David N. Beratan, and Joseph W. Perry, both of South Pasadena, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Administration, Washington, D.C.

Filed Feb. 15, 1990, Ser. No. 480,385
Int. Cl.[5] G02B *5/23, 1/01, 1/12*
U.S. Cl. 359—241 20 Claims



1. An all-optical, two-dimensional spatial light modulator adapted to switch transmissive properties for a certain amount of time at specific locations comprising:

(a) a multi-state intermolecular charge transfer system capable of switching electrons between states;

(b) optical means for supplying input data to said charge transfer system; and

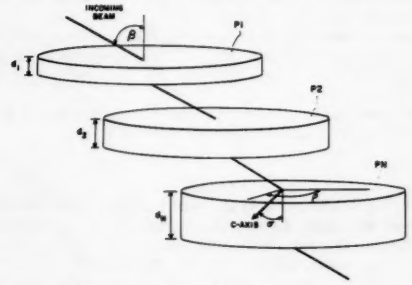
(c) optical means for supplying an input electromagnetic wave which induces electron transfer in said charge transfer system to provide an output electromagnetic wave, the intensity of said output electromagnetic wave being spatially modulated by said input data.

5,062,694

BIREFRINGENT FILTER DESIGN

Clayton H. Bair, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 8, 1991, Ser. No. 681,288
Int. Cl.[5] G02B *27/28*
U.S. Cl. 359—498 4 Claims



1. A birefringent filter comprising:

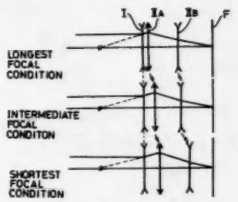
a plurality of N plates of an optical material exhibiting birefringence, each of said plates having a respective thickness $d_1, d_2 \ldots d_N$, wherein $d_1 < d_2 \ldots < d_N$, the respective thicknesses $d_1 \ldots d_N$ are non-unity, integral multiples of the difference in thickness between d_1 and d_2, and the plates are stacked such that light to be filtered passes in order through the plates having respective thicknesses of $d_1, d_2 \ldots d_N$.

5,062,695

ZOOM LENS SYSTEM FOR USE IN A MICROFILM PROJECTION APPARATUS

Satoshi Iwasaki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1990, Ser. No. 486,060
Claims priority, application Japan, Feb. 28, 1989, 1-47492
Int. Cl.[5] G02B *15/17715/16*
U.S. Cl. 359—689 14 Claims



1. A zoom lens system comprising, in order from an enlargement side:

a first lens unit of a negative power;

a second lens unit of a positive power, and

a third lens unit of a negative power,

wherein, during a zooming operation from a longest focal length condition to a shortest focal length condition, said first lens unit is fixed, whereas said second lens unit and said third lens unit are movable from the enlargement side to a reduction side, with the distance between said second lens unit and said third lens unit first decreasing, then increasing, during said zooming operation, the zoom lens system satisfying the following conditions:

$$1.7 < (\Psi_I + \Psi_{II})/\Psi_L < 2.2$$

$$2.5 < \Psi_{II\ III}/\Psi_L < 3.0$$

where Ψ_I represents a refracting power of said first lens unit, Ψ_{II} represents a refracting power of said second lens unit, Ψ_L represents a refracting power of the entire system in the longest focal length condition, and $\Psi_{II\ III}$ represents a combined refractive power of said second and third lens units in the longest focal length condition.

5,062,696

CAMERA APPARATUS

Mitsuaki Oshima, Moriguchi; Masataka Izaki, Yawata; Jirou Kajino, Neyagawa; Yoshiaki Igarashi, Ikoma, and Hiroshi Mitani, Daito, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 886,424, Jul. 17, 1986, Pat. No. 4,856,882, which is a division of Ser. No. 688,154, Dec. 31, 1984, Pat. No. 4,623,930. This application Feb. 17, 1989, Ser. No. 312,057
Claims priority, application Japan, Dec. 29, 1983, 58-251306
Int. Cl.[5] G02B *27/64;* G03B *15/00*
U.S. Cl. 359—554 4 Claims

1. A camera apparatus comprising:

focusing means for optically focusing a light beam from an object;

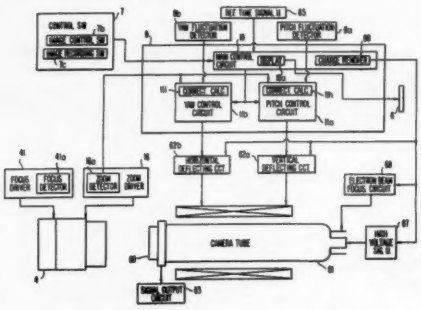
imaging means for converting an optical image produced by the focusing means into electric or physiochemical information and issuing or recording the information as an image;

means for detecting a fluctuation of the camera apparatus and issuing a fluctuation detecting signal;

means responsive to the fluctuation detecting signal for issuing an image fluctuation control signal;

means responsive to the image fluctuation control signal for suppressing a fluctuation of the image due to the fluctuation of the apparatus;

said imaging means comprising means for photoelectrically



converting the optical image produced by said focusing means into image information, electric readout means for reading out the image information, and means for issuing an image-dependent electric signal, said electric readout means being controllable by said image fluctuation control signal issuing means dependent on information from said detecting means.

5,062,697

PORTABLE MICROSCOPE APPARATUS

Phillip R. Mitchell, 20½ Dexter St., Apt. I, Providence, R.I. 02909

Filed Aug. 8, 1990, Ser. No. 564,118

Int. Cl.[5] G02B *21/06, 21/24, 21/34, 25/02*

U.S. Cl. 359—379 **8 Claims**

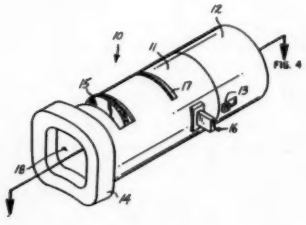


FIG. 4

1. A portable microscope apparatus for permitting visual observation in comparison of a blood sample wherein the apparatus comprises,

a first cylindrical body selectively securable to a second cylindrical body wherein the first and second cylindrical bodies are coaxially aligned relative to one another, and

the second cylindrical body includes a cup shaped cavity defining an illumination compartment therewithin, and

the illumination compartment including illumination means therewithin selectively actuatable to effect selective actuation of the illumination means, and

the first cylindrical body member including a forward terminal end coaxially aligned with and spaced from the second cylindrical body and the forward cylindrical end defining a forward opening, and

a first body web fixedly and diametrically mounted within the first said cylindrical body adjacent said forward opening, first body web adjustably mounting a focusing lens, and adjusting means for axially mounting and adjusting the focusing lens relative to the first body web, and

at least one fixed lens member mounted rearwardly of the focusing lens within the first cylindrical body member and coaxially aligned relative to the focusing lens, the said at least one fixed lens positioned between the focusing lens and the illumination means, and

a slide member selectively receivable within the first cylindrical body member between the fixed lens and the illumination means.

5,062,698

FOCUSING DEVICE FOR A BINOCULAR INSTRUMENT

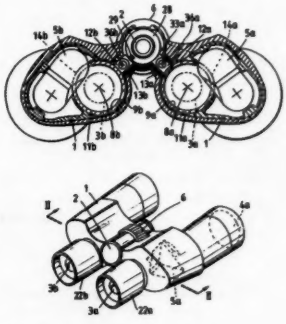
Gouzi Funathu, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 381,542, Jul. 19, 1989, abandoned. This application Jan. 25, 1991, Ser. No. 646,443

Claims priority, application Japan, Jul. 21, 1988, 63-183151; Jul. 21, 1988, 63-183152; Jul. 21, 1988, 63-183153

Int. Cl.[5] G02B *7/06, 23/18*

U.S. Cl. 359—414 **11 Claims**



1. A binocular instrument comprising:

a binocular body;

a pair of right and left ocular lenses;

a single focusing drive means provided between the right and left ocular lenses for simultaneously moving the right and left ocular lenses forward and backward in a direction of an optical axis to effect focusing;

a pair of right and left guide holes formed in said body extending inwardly from an ocular side end of said body, the guide holes extending in coaxial relation to respective ocular optical axes, and a wall of each of the guide holes having a slot, formed parallel to a respective one of said ocular optical axes, through which each of right and left connecting means extends;

a pair of right and left ocular tubes respectively supporting said ocular lenses and being received respectively in the guide holes to as to be slidable along the respective ocular optical axes; and

said right and left connecting means for connecting each of the ocular tubes to said focusing drive means.

5,062,699

PIVOTLESS EQUATORIAL TABLE FOR A TELESCOPE

Georges d'Autume, Le Vesinet, France, assignor to Jupiter Telescope Co., Inc., Wellington, Fla.

Filed Aug. 11, 1989, Ser. No. 392,449

Int. Cl.[5] G02B *23/16, 23/00*

U.S. Cl. 359—430 **21 Claims**

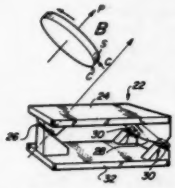
1. A pivotless equatorial table for a telescope, said table comprising:

a substantially planar telescope table portion, said table portion having a top side and a bottom side;

a table base situated below said table portion;

said table base having provided thereupon a plurality of rolling bodies;

a conical assembly for coacting said table portion with said plurality of rolling bodies about a common virtual axis, said common virtual axis being aligned in parallel with the polar axis of the earth;



said conical assembly comprising a plurality of tracks constrained by gravity to remain in contact with said plurality of rolling bodies;

said tracks being rotation 21 symmetrical about said common virtual axis.

5,062,700

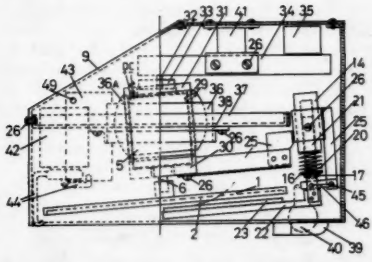
REARVIEW DIRECTIONAL CONTROL DEVICE FOR REARVIEW MIRROR

Shyh-Her Sheu, No. 18, Shihchien Street, Peitoa, and Yu-Ming Tsui, No. 16-11, 3rd. Floor Lane 189, Sec. 4, Cheng Kung Road, Neihu Locality, Taipei, both of Taiwan

Filed Jan. 8, 1991, Ser. No. 638,539

Int. Cl.[5] G02B *7/198, 5/08;* **B60S** *1/34, 1/46*

U.S. Cl. 359—508 **7 Claims**



1. A rearview directional control device for a rearview mirror comprising:

a rearview mirror body adapted to be fixed to one side of a vehicle:

a spherical plain bearing mounted in said body and having an inner ring:

a sleeve secured in said inner ring, having an open end;

a gear box mounted on said body having a power output shaft and a power input end:

an eccentrical wheel secured to said power output shaft and is engagingly received in said open end;

a motor mounted on said body and is connected to said power input end:

a mirror fixed on one side of a mirror disk and a disk shaft is provided on the other side of said mirror disk; and

said disk shaft is engaged in the other end of said sleeve,

such that when said motor is energized, the angle of said mirror will be adjusted.

5,062,701

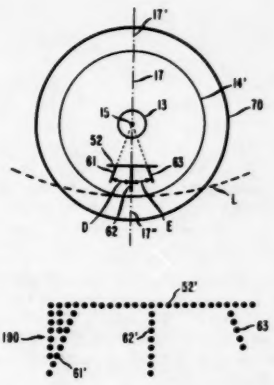
ASYMMETRIC CONTACT LENS

Martin J. Drazba, Arlington Heights; Michael L. Bellek, Lindenhurst; Samuel Dranoff, Buffalo Grove, and Paul Hahn, Loves Park, all of Ill., assignors to Wesley-Jessen Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 203,381, Jun. 7, 1988, Pat. No. 4,976,533. This application Nov. 16, 1990, Ser. No. 614,356

Int. Cl.[5] G02C *7/04;* **A61B** *3/00*

U.S. Cl. 351—160 R **6 Claims**



1. A contact lens comprising: p1 A. a corneal section intended to cover the cornea of the wearer;

B. a pupil section within said corneal section intended to cover the pupil of the wearer;

C. a vertical axis having a top intended to be located at the top of the wearer's eye and bottom intended to be located at the bottom of the wearer's eye;

D. a shape adapted to maintain said lens at its intended orientation within the eye;

E. a visible horizontal line segment located within said corneal section perpendicular to said vertical axis, said line segment and its extensions being outside of said pupil section;

F. an asymmetric prescription located over at least a portion of said corneal section, and

G. extra marking to cause the combination of said line segment and extra marking to be asymmetric about said vertical axis.

5,062,702

DEVICE FOR MAPPING CORNEAL TOPOGRAPHY

Josef F. Bille, Rancho Santa Fe, Calif., assignor to Intelligent Surgical Lasers, Inc., San Diego, Calif.

Filed Mar. 16, 1990, Ser. No. 494,683

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—212 **5 Claims**

1. A device for mapping the topography of the cornea of an eye which comprises:

means for generating a beam of collimated monochromatic light characterized by having a flat directed wave front;

means for directing said beam toward said cornea;

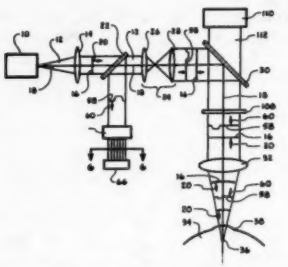
an objective lens for converting said flat wave front into a spherically converging wave front for incidence on said cornea;

means for receiving light of said beam reflected by said cornea, said reflected light being characterized by a reflected wave front indicative of said topography;

a charge-coupled device;

a lens array comprising a first layer having a plurality of juxtaposed cylindrical lenses and a second layer having a

plurality of juxtaposed cylindrical lenses, said first layer being adjacent said second layer and substantially perpendicular thereto to collectively receive said reflected wave front to detect deviations of said reflected wave front



from said flat wave front and individually focus the light incident on each of said cylindrical lenses onto said charge-coupled device to create a pattern on said charge-coupled device indicated of said topography.

5,062,703

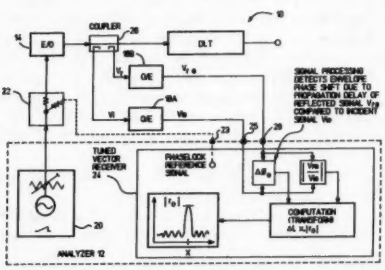
METHOD AND APPARATUS FOR MEASURING THE LENGTH OF, OR DISTANCES TO DISCONTINUITIES IN, AN OPTICAL TRANSMISSION MEDIUM

Roger W. Wong; Hugo Vifian, both of Santa Rosa, and Michael G. Hart, Windsor, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 146,642, Jan. 21, 1988, abandoned. This application Feb. 2, 1990, Ser. No. 474,184

Int. Cl.[5] G01N *21/00*

U.S. Cl. 356—73.1 **20 Claims**



1. A method for measuring optical reflections, which allows resolution of one or more optical reflections due to one or more corresponding discontinuities in an optical device under test, comprising the steps of:

producing a continuous wave optical signal;

producing at least one modulating signal;

modulating the continuous wave optical signal with the at least one modulating signal to produce at least one modulated optical signal;

applying the at least one modulated optical signal to the optical device under test;

thereby producing incident and reflected modulated optical signals in the optical device under test, the reflected modulated optical signal being produced by the at least one modulated optical signal being reflected as the modulated optical signal encounters a change in the index of refraction caused by a discontinuity in the optical device under test;

detecting a phase value of an envelope of the incident modulated optical signal and a phase value of an envelope of the reflected modulated optical signal;

comparing the values of the phase envelopes of the incident and reflected modulated optical signals to determine an envelope phase difference;

calculating a propagation delay difference between the incident and reflected modulated optical signals from the envelope phase difference and the speed of light according to the expression $X=(vel/2)*Delta\ Phi_e/w_m$, where x is the distance to a discontinuity in the optical device under test, vel is the propagation velocity of the continuous wave in the optical device under test, $DeltaPhi_e$ is the envelope phase difference, and w_m is the at least one modulating frequency.

5,062,704

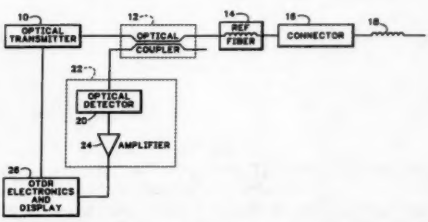
OPTICAL TIME DOMAIN REFLECTOMETER HAVING PRE AND POST FRONT PANEL CONNECTOR TESTING CAPABILITIES

Glenn Bateman, Redmond, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 25, 1990, Ser. No. 514,070

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—73.1 **5 Claims**



1. An improved optical time domain reflectometer having an optical transmitter and receiver coupled to a front panel connector via an optical coupler, the transmitter launching optical pulses into a fiber under test connected to the front panel connector and the optical receiver receiving backscattered light from the fiber that includes a reflective pulse from the front panel connector, the improvement comprising a reference optical fiber interposed between the optical coupler and the front panel connector having a length that is a function of the pulse width of the launched optical pulses permitting the acquisition of a reference backscatter level prior to the front panel connector for comparing with the backscattered light from the fiber under test to determine a loss for the front panel connection and acquisition of data representative of the front panel connector reflective pulse.

5,062,705

APPARATUS FOR EVALUATING A LENS

Takeo Sato, Kawasaki; Masaki Yamamoto, Tokyo; Shinichiro Aoki, Kawasaki; Yoshiyuki Sugiyama, Ayase; Yoshito Nakanishi, and Hiroyuki Takeuchi, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 11, 1990, Ser. No. 580,752

Claims priority, application Japan, Sep. 13, 1989, 1-237797; Oct. 19, 1989, 1-272841; Oct. 19, 1989, 1-272844

Int. Cl.[5] G01B *9/00*

U.S. Cl. 356—124 **9 Claims**

1. An apparatus for evaluating a lens, comprising:

a first reticle located at an object position of the lens and formed with a first diffraction grating;

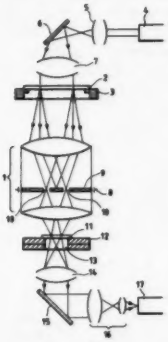
a stage supporting the first reticle;

a coherent light source illuminating a whole region of the first diffraction grating;

a spatial filter blocking a 0-order component of diffraction light from the first diffraction grating;

a second reticle located at an image position of the lens and formed with a second diffraction grating;

a stage moving the second reticle within a projection range of the lens; and



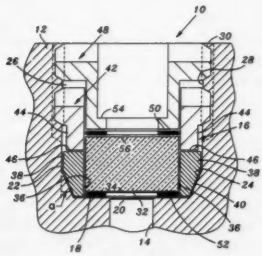
means for observing moire fringes which are caused by the second diffraction grating and interference fringes, the interference fringes being formed on the second reticle by re-diffraction by the lens.

5,062,706

HIGH PRESSURE FLUID SAMPLE FLOW CELL WITH CIRCUMFERENTIAL WINDOW EDGE SEAL

Haakon T. Magnussen, Jr., Orinda, Calif., assignor to Rainin Instrument Co., Inc., Emeryville, Calif.

Filed Apr. 16, 1990, Ser. No. 510,038
Int. Cl.[5] G02B *7/00*
U.S. Cl. 356—246 **7 Claims**



1. In a high pressure flow cell including a cell body having a passageway therethrough and windows for passing light through fluid flowing in the passageway, a high pressure circumferential window edge seal, comprising:

a window receiving cavity including a flat inner end surrounding an opening to the fluid passageway, an inner end portion including an inner axially extending radially outwardly diverging annular surface adjacent the inner end, and a outer end portion including an axially extending internally threaded annular surface adjacent an outer end of the cavity;

a cylindrical window in the inner end portion of the cavity and including a flat end over the flat inner end of the cavity and a cylindrical circumferential edge adjacent the inner annular surface of the cavity;

an annular ferrule around the circumferential edge of the window and adjacent the inner annular surface of the cavity, the ferrule including an axially extending radially outwardly diverging surface for mating with the outwardly diverging surface of the inner annular end portion of the cavity; and

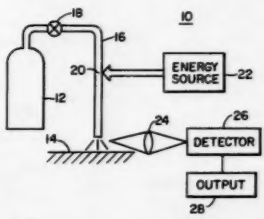
a ferrule clamp comprising a tubular screw threaded into the outer end portion of the cavity and including and annular end for pressing axially on an outer end of the ferrule to wedge the ferrule and create a fluid tight high pressure seal between the circumferential edge of the window and the inner annular surface of the cavity.

5,062,707

SURFACE CONTAMINATION SENSOR

Steven Adler-Golden, Newtonville, and Michael W. Matthew, Burlington, both of Mass., assignors to Spectral Sciences, Inc., Burlington, Mass.

Filed Nov. 6, 1990, Ser. No. 609,875
Int. Cl.[5] G01N *21/71, 21/88*
U.S. Cl. 356—311 **23 Claims**



1. An ambient surface contamination sensor, comprising:

means for supplying a gas to a surface being sensed;

means for energizing the gas before it reaches the surface for transferring energy to surface contaminants;

means for detecting the optical emission from the gas passed over the surface within a selected wavelength band characteristic of the presence on the surface of the contaminant; and

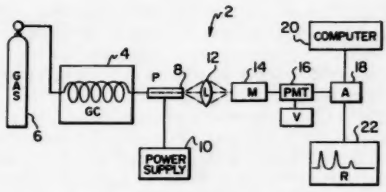
means, responsive to said means for detecting, for indicating the presence of the contaminant on the surface.

5,062,708

CAPACITIVELY COUPLED PLASMA DETECTOR FOR GAS CHROMATOGRAPHY

Dong C. Liang, Vancouver, and Michael W. Blades, Surrey, both of Canada, assignors to University of British Columbia, Vancouver, Canada

Filed May 19, 1989, Ser. No. 354,150
Int. Cl.[5] G01N *21/73*
U.S. Cl. 356—316 **13 Claims**



1. A method of spectroscopically investigating compounds separated in the eluant of a gas chromatograph comprising the steps of:

passing the eluant of the gas chromatograph into a radio-frequency atmospheric pressure capacitively coupled plasma created between a pair of opposing electrically conducting electrodes;

applying radio-frequency power from a power supply to the electrodes sufficient to create a plasma in the eluant passing between the electrodes; and

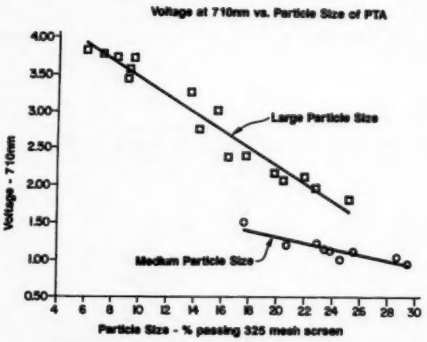
analyzing the light spectrum emitted from the plasma.

5,062,709

PROCESS FOR MONITORING PARTICLE SIZE AND MOISTURE CONTENT OF FINELY DIVIDED MATERIAL

James D. Slee, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Apr. 25, 1990, Ser. No. 514,504
Int. Cl.[5] G01N 15/02
U.S. Cl. 356—335 14 Claims



1. A process for on-line monitoring of particle size and moisture content of finely-divided material in a product stream wherein said material reflects scattered light sufficient for detection by a photodetector, the light is of a wavelength within the range of from about 350 nanometers to about 1200 nanometers, particle size of said material is from about 1 micron to about 300 microns and moisture content is no greater than 10 weight percent of said material, which process comprises:

a. a sampling means comprising a sampling vessel located in said product stream wherein said sampling vessel contains a discharge means to discharge continuously or periodically;

b. a reference light source;

c. a spectrophotometric analyzer having a plurality of photodetectors for the characterization of wavelengths of scattered light within the range of from about 350 nanometers to about 1200 nanometers;

d. a communication means, having a first end connected to the light source and a second end extending into the sampling means;

e. a light transmission means capable of transmitting scattered light of wavelengths from about 350 nanometers to about 1200 nanometers from the sampling means to the plurality of photodetectors within the spectrophotometric analyzer;

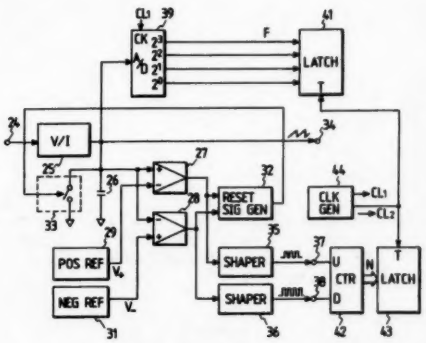
f. a signal processor means in communication with the plurality of photodetectors for processing the characteristics of the said wavelengths to quantify the photodetector responses in volts to (i) measure the percent particles of said finely-divided material of particle size within the range of from about 1 micron to about 300 microns as measured by the voltage generated by a photodetector which measures the intensity of scattered light of a selected wavelength wherein said selected wavelength is within the range of from about 350 nanometers to about 1200 nanometers; and (ii) to measure the moisture content of said finely-divided material by the standard deviation of measurements of voltages generated by a photodetector which measures the said intensity of said scattered light of at least one wavelength within the range of from about 350 nanometers to about 1200 nanometers.

5,062,710

LINEAR PHASE RAMP FIBER OPTIC GYRO

Kenichi Okada; Masashi Nishino, and Shu Tanigawa, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed Apr. 18, 1990, Ser. No. 510,846
Claims priority, application Japan, Apr. 20, 1989, 1-102188
Int. Cl.[5] G01C 19/72
U.S. Cl. 356—350 2 Claims



1. A linear phase ramp fiber optic gyro comprising:

means defining an optical path which makes at least one turn;

means for applying right-handed light and left-handed light to said optical path;

interference means whereby right-handed light and left-handed light having propagated through said optical path are caused to interfere with each other;

phase difference generating means between said interference means and one end of said optical path for providing a phase difference between said right-handed light and said left-handed light;

photoelectric conversion means whereby the intensity of interference light available from said interference means is output as an electrical signal;

phase detecting means for detecting and outputting information about said phase difference between said right-handed light and said left-handed light, contained in the output electrical signal of said photoelectric conversion means;

ramp voltage generating means for generating a ramp voltage output of a frequency and polarity corresponding to the output of said phase detecting means and for negatively feeding said ramp voltage output back to said phase difference generating means so that the phase difference between said right-handed light and said left-handed light is reduced to zero;

counter means for counting pulses of said ramp voltage generated by said ramp voltage generating means;

clock generating means for generating first and second clocks, said second clocks being higher in frequency than said first clocks;

A/D conversion means for converting said ramp voltage output of said ramp voltage generating means into a digital value upon each occurrence of said second clocks; and

first and second latches for simultaneously latching the count value of said counter means and the output digital value of said A/D conversion means upon each occurrence of said first clocks;

the count value of said counter means and said digital output value of said A/D conversion means respectively latched in said first and second latches being used in combination as angular information.

5,062,711

METHOD AND APPARATUS FOR INSPECTING WORKPIECES

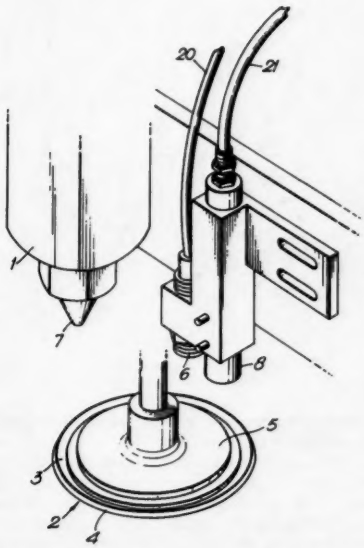
Derek A. Brown, Buckinghamshire; John N. Worth, Bedford, and Brian F. Santaniello, Staffordshire, all of England, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Nov. 13, 1989, Ser. No. 434,731

Claims priority, application United Kingdom, Nov. 23, 1988, 8827325; Jun. 9, 1989, 8913279

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—394 15 Claims



1. A method of inspecting a workpiece comprising the steps of:

(a) holding a workpiece at an inspection station,

(b) illuminating a region of the workpiece and observing by means of an observation head the reflected illumination from that region for evaluation of the reflectance properties of the workpiece,

(c) detecting the position of the workpiece to initiate a scanning phase only when the workpiece is in a predetermined positioned relative to the observation head, said observation head emitting signals representative of the reflection from said illuminated region,

(d) scanning the illuminated region along a closed path over the surface of the workpiece for at least one complete circuit of the closed path to define the scanning phase,

(e) discontinuing the scanning phase when the workpiece leaves the predetermined position; and

(f) processing the signals derived from the observation head only during the scanning phase for indicating acceptability in the case of a workpiece corresponding to certain predefined conditions and indicating a rejection signal in the case of a workpiece which does not correspond to the predefined conditions; wherein the predefined conditions include change of the reflected illumination from a first level representing an unfinished state of the illuminated region of the workpiece to a second level representing the result of further processing; and wherein a rejection is indicated when one of failure to the change, and a variation from the second level representing poor quality of the further processing, is observed.

5,062,712

ALIGNING APPARATUS WITH A COARSE/FINE MOVEMENT CONTROLLER AND AN ULTRAFINE MOVEMENT CONTROLLER

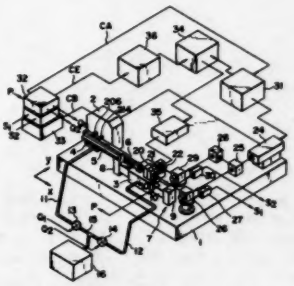
Shigeru Sakuta, Yokosuka, and Katsunobu Ueda, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 6, 1990, Ser. No. 488,890

Claims priority, application Japan, Mar. 7, 1989, 1-54601; Mar. 7, 1989, 1-54602; Dec. 28, 1989, 1-344352; Feb. 7, 1990, 2-26131

Int. Cl.[5] G01B *11/14*

U.S. Cl. 356—400 13 Claims



1. A coarse/fine movement aligning apparatus comprising:

coarse movement driving means for coarsely moving

fine adjustment means for finely moving the object to be aligned;

position detection means for detecting a position of the object to be aligned;

coarse/fine movement control means for selectively and simultaneously operating said coarse movement driving means and said fine adjustment means based on a difference between the detection position by said position detection means and a target position of the object to be aligned; and

ultrafine movement control means for ultrafinely operating said fine adjustment means to cause the object to be aligned to coincide with the target position.

5,062,713

METHOD FOR DETERMINING THE RESIDENCE TIME DISTRIBUTION OF A POLYMER EXTRUDER

Stuart Farquharson, Freeport, and Peter T. Keillor, III, West Columbia, both of Tex., assignors to The Dow Company, Midland, Mich.

Continuation of Ser. No. 403,552, Sep. 6, 1989, abandoned. This application Nov. 1, 1990, Ser. No. 608,066

Int. Cl.[5] G01I *3/46;* G01N *21/25;* G01J *3/42*

U.S. Cl. 356—402 1 Claim

1. A method for determining the residence time distribution of a polymer extruder on the line, comprising the steps of:

(a) flowing a polymer from the polymer extruder;

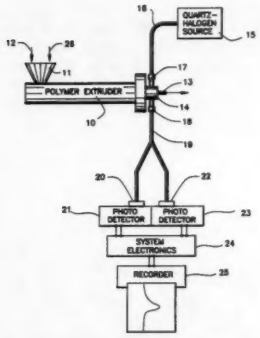
(b) introducing a tracer chemical into the extruder, the tracer chemical having a first wavelength of absorption of light where its absorbency of light is greater than its absorbency of light at a second wavelength;

(d) passing a beam of polychromatic light through the polymer flowing from the polymer extruder;

(e) splitting the beam of the light passed through the polymer flowing from the polymer extruder into a first part and a second part;

(f) directing the first part through a first optical filter to a first photodetector to generate a first signal, the wavelength of maximum transmission of the first filter being near the first wavelength of absorption of the tracer chemical, the first signal being a function of the concentration of the tracer chemical in the polymer;

(g) directing the second part through a second optical filter and to a second photodetector to generate a second signal, the wavelength of maximum transmission of the second filter being near the second wavelength of absorption of



the tracer chemical, the second signal being a function of the background absorbency of the polymer;

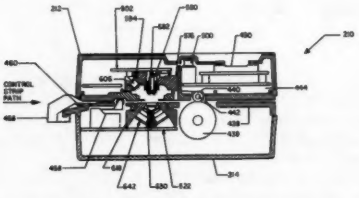
(h) correcting the first signal with the second signal to obtain a signal that over time after step (b) represents the residence time distribution of the polymer extruder.

5,062,714

APPARATUS AND METHOD FOR PATTERN RECOGNITION

Steven H. Peterson, Wyoming, and Timothy R. Friend, Jenison, both of Mich., assignors to X-Rite, Incorporated, Grandville, Mich.

Filed Feb. 12, 1990, Ser. No. 478,475
Int. Cl.[5] G01J *3/51*
U.S. Cl. 356—406 **40 Claims**



1. A method adapted for use in a densitometer system for measuring color characteristics of object samples under test, said method directed to comparison of color data read from a control strip object sample with color data previously stored in a memory means of said densitometer system, said method comprising the steps of:

reading said control strip and storing data samples representative of color samples of said control strips;

storing with each of said data samples a distance measurement indicative of a position of each of said data samples;

formatting said data samples into a plurality of regions, each of said regions comprising a plurality of successive data samples having common parameters within predetermined tolerances;

comparing each of said regions with said previously stored color data; and

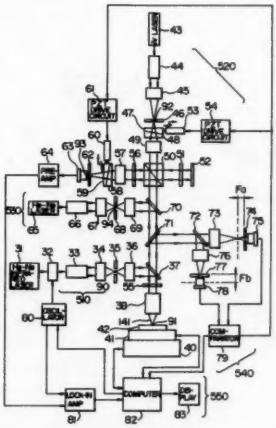
generating an indication to an operator of said densitometer system whether said regions match or do not match said previously stored color data.

5,062,715

METHOD AND APPARATUS FOR DETECTING PHOTOACOUSTIC SIGNAL AND METHOD FOR DETECTING INTERNAL DEFECT OF SEMICONDUCTOR DEVICE

Toshihiko Nakata, and Yukio Kembo, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1990, Ser. No. 479,712
Claims priority, application Japan, Mar. 17, 1989, 1-063604
Int. Cl.[5] G01N *21/25, 21/71*
U.S. Cl. 356—432 **19 Claims**



1. A method for detecting internal structure information of a sample comprising the steps of:

generating a laser beam having a wavelength such that the laser beam penetrates through the sample;

intensity-modulating said laser beam at a desired frequency for causing a short thermal diffusion length μs corresponding to a desired high resolution, said intensity-modulated laser beam being emitted from a first light source;

focusing said intensity-modulated laser beam into a fine spot in a predetermined depth of the sample by removing high order diffraction light components; and

detecting a thermal distortion due to a photoacoustic effect generated at a fine area in the sample by the focused fine spot of said intensity-modulated laser beam in said predetermined depth of the sample, by a thermal distortion detecting means,

whereby said internal structure information of the sample is detected at said desired high resolution in accordance with a thermal distortion signal detected by said thermal distortion detecting means.

5,062,716

STAGED RELEASE BAG AND METHOD FOR MAKING

Daniel J. Conrad; Jerry W. Davenport, both of Murfreesboro, Tenn.; Robert R. Isen, Philadelphia, Pa.; Michael A. Bullock, Murfreesboro, Tenn., and Wilfred E. Riddell, Neenah, Wis., assignors to Kimberly-Clark Corp., Neenah, Wis. and Paramount Packaging Corp., Chalfont, Pa.

Filed Mar. 7, 1990, Ser. No. 490,014
Int. Cl.[5] B65D *33/06*
U.S. Cl. 383—9 **11 Claims**

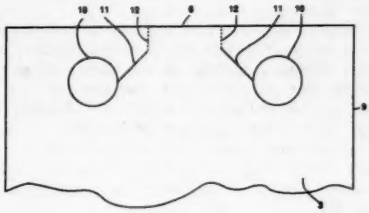
1. A multilayered bag of plastic material having a filling edge and being securable to a filling mandrel comprising:

(A) a wicket opening;

(B) a stabilizing cut having first and second ends; and

(C) a release path, said stabilizing cut being formed from a weakened line of bag material, said first end extending

from said wicket opening to said release path, said release path extending from said stabilizing cut to the filling edge of the bag, said release path being formed from a weakened line of bag material, said stabilizing cut being oriented so as to form an acute angle with a geometric ray having an origin at said first end and a direction parallel to said filling edge.



5,062,717

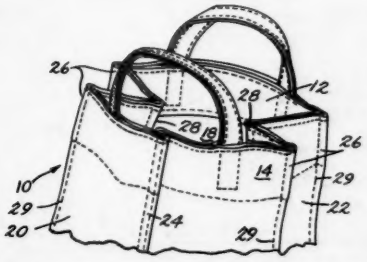
SHOPPING BAG WITH HANDLE

Dru Shockley, 3904 McTyres Cove Ct., Midlothian, Va. 23113

Filed Oct. 31, 1990, Ser. No. 606,599

Int. Cl.[5] B65D *33/02, 33/14*

U.S. Cl. 383—20 **10 Claims**



1. A bag structure comprising parallel front and rear panels which face each other, said panels having longitudinal edges and upper portions, rectangular side pieces of pleated construction integrally connected to the corresponding longitudinal edges of said front and rear panels and extending transversely between said front and rear panels when the bag is open for reception of articles; a plurality of top strips at the upper portions of said front and rear panels and said side pieces, whereby a multiple ply border or web extends around the top of said bag; a base portion integrally connected to said side pieces and said front and rear panels to seal the bottom of said bag; said base portion having a selvage continuous around the perimeter of said base portion and having portions of said selvage exposed to the exterior of said bag; multiple bottom folds in said base portion in overlapping relationship with each other, whereby said base is of reinforced planar construction; means for reinforcing the corners of said side pieces extending from the top of said border or web to said base portion; and handle means attached to said border to web in a load-supporting relationship.

5,062,718

ONE-HALF PART OF A SLIDING SURFACE BEARING

Hugo Lenhard-Backhaus; Otto Ehrentraut, both of Gmunden, and Ottmar Haager, Laakirchen, all of Austria, assignors to Miba Gleitlager Aktiengesellschaft, Laakirchen, Austria

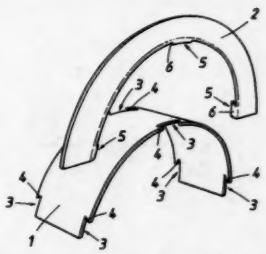
PCT No. PCT/AT88/00050, § 371 Date Mar. 3, 1989, § 102(e) Date Mar. 3, 1989, PCT Pub. No. WO89/00250, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 6, 1988, Ser. No. 345,706

Claims priority, application Austria, Jul. 6, 1987, 1689/87

Int. Cl.[5] F16C *33/06, 17/10*

U.S. Cl. 384—294 **4 Claims**



1. A half part of a substantially semi-cylindrical sliding surface bearing having an axis, the bearing consisting of a bearing half-shell having end faces extending transversely to the axis and at least one stop collar constituted by a separate end flange, the end faces of the bearing half-shell defining undercut and open-ended fitting openings extending in an axial direction and the stop collar having axially aligned mounting lugs protruding toward the bearing half-shell and extending into the openings and behind the undercuts thereof.

5,062,719

ROLLER BEARING CAGE

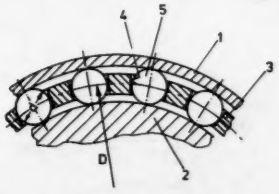
Bernhard Bauer, Hassfurt; Heinz Reichle, Tuttlingen, and Robert Stolz, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 23, 1990, Ser. No. 602,123

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 3936451

Int. Cl.[5] F16C *33/54*

U.S. Cl. 384—450 **2 Claims**



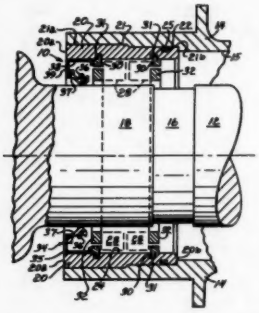
1. In a rolling element bearing cage assembly including a cage made of a bent strip of sheet metal having abutting ends connected to one another, wherein the cage is comprised of two end rings and a cage frame surrounding a plurality of windows, said windows retaining and guiding rolling elements, the improvement wherein the center distance of the cage windows in a flat development of the cage section is $\pi d/2$, in which d is the diameter of the rolling elements.

5,062,720

REPLACEMENT BEARING FOR WORN SHAFTS

David A. Hall, Indianapolis, and John R. Marjancik, Brownsburg, both of Ind., assignors to Rexnord Corporation, Milwaukee, Wis.

Filed Feb. 13, 1990, Ser. No. 479,294
Int. Cl.[5] F16C *25/06*
U.S. Cl. 384—484 10 Claims



1. A bearing assembly for supporting a rotating axle shaft within an axle housing containing axle lubricant, the rotating axle shaft including an annular worn portion and an annular unworn portion, the bearing assembly including:

an annular sleeve means adapted for sealing engagement with the axle housing,

a plurality of bearing element radially positioned on the inside annular surface of the annular sleeve means and adapted to engage an unworn portion or the axle shaft;

a single lip seal member mounted to a retaining housing fitted to the inner annular surface of the annular sleeve means and engageable with the rotating shaft to seal the rotating shaft within the axle housing and to retain the axle lubricant within the bearing assembly and axle housing, and

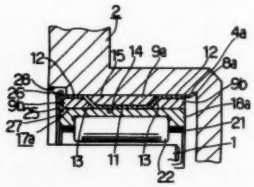
said annular sleeve means includes an outer annular surface containing a sealing compound affixed thereto to provide the sealing engagement with the axle housing.

5,062,721

ROLLING BEARING WITH SLEEVE

Moichi Chiba, Yokosuka, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 515,937
Claims priority, application Japan, Apr. 28, 1989, 1-107343; May 16, 1989, 1-55253[U]; May 16, 1989, 1-55254[U]
Int. Cl.[5] F16C *27/00*
U.S. Cl. 384—536 4 Claims



1. A rolling-bearing/sleeve assembly, comprising:

a rolling bearing which has an outer ring and a plurality of rolling bodies, such that said outer ring has inner and outer peripheral surfaces and an inner raceway on said inner peripheral surface thereof and said plurality of rolling bodies are rotatably provided on said inner raceway; and

a bearing support sleeve including:

a metal core having outer and inner peripheral surfaces and a high degree of dimensional elasticity to have a larger radial thickness in a free state and fabricated in a short cylindrical shape with a width which is indented across said width in cross section, and

a cylindrical spacer section of synthetic resin having an outer peripheral surface laminated with said core on said outer peripheral surface thereof, such that, at normal temperature, one part of said outer peripheral surface of said core and one part of said outer peripheral surface of said cylindrical spacer section are flush with each other to conjointly form a single outer peripheral surface;

wherein said bearing support sleeve is secured to said outer peripheral surface of said outer ring of said rolling bearing, and

wherein said outer ring forming said rolling bearing is formed on said outer peripheral surface thereof with a concave engaging section,

said core has an edge section and a first tongue leaf projected from said edge section to be inwardly folded to form a first folded leaf which is freely engaged with said concave engaging section, and

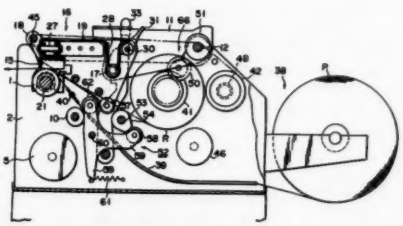
said core has a second tongue leaf projected from said edge section to be outwardly folded to form a second folded leaf for engagement in a housing means for supporting the rolling bearing/sleeve assembly.

5,062,722

THERMAL PRINTER WITH RECIPROCAL PAPER FEED CONTROL

Tsugio Shiozaki, Susono; Satoshi Kitahara, Mishima; Osamu Koizumi, Shizuoka, and Ikuzo Sugiura, Sagamihara, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 256,762, Oct. 11, 1988, Pat. No. 4,953,991.
This application Jul. 12, 1990, Ser. No. 552,405
Claims priority, application Japan, Oct. 14, 1987, 62-157117; May 6, 1988, 63-59824
Int. Cl.[5] B41J *3/20, 11/66*
U.S. Cl. 400—120 8 Claims



1. A thermal printer, comprising:

a platen (1);

platen supporting means (2) for rotatably supporting the platen;

platen driving means (3,5,7) for rotating the platen to feed a printed paper sheet in a downstream direction;

a thermal head (15) disposed opposite the platen for printing a paper sheet;

head driving means (11,16) for selectively moving the thermal head between a first position in which the thermal head is pressed against the platen for printing, and a second position in which the thermal head is disengaged from the platen;

sheet cutting means (151) disposed on the downstream side of the platen for cutting the paper sheet;

sheet transportation means (9,10,62) which is selectively brought to a first operating state, in which it conveys the paper sheet in said downstream direction, and a second operating state, in which it conveys said paper sheet in an upstream direction; and

control means (152) for controlling the head driving means, the sheet transportation means and the cutting means such that after the paper sheet is cut by the cutting means, the paper sheet is conveyed in the upstream direction while the thermal head is positioned in the second position, disengaged from the platen, until a cut end of a remaining portion of the paper sheet is situated on the platen, and for thereafter causing the thermal head to be brought to the first position, and the paper sheet to be conveyed in the downstream direction for printing.

5,062,723

PRINTING APPARATUS

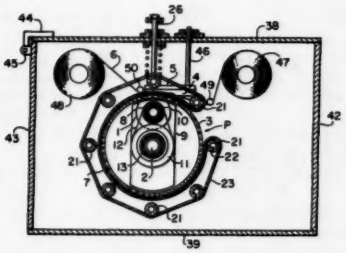
Fumio Takeda, Ushiku; Takashi Yoshida, Ibaraki; Hiroya Taguchi, Tokyo; Tsutomu Omine, Mito, and Mitsugu Asano, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed May 17, 1989, Ser. No. 353,695

Claims priority, application Japan, May 18, 1988, 63-119123

Int. Cl.[5] B41J *3/02*

U.S. Cl. 400—120 **24 Claims**



12. A thermal-transfer printing apparatus of the type which effects thermal-transfer printing on a printing medium using an ink film, the thermal-transfer printing apparatus comprising: a rotatably supported platen roller having a surface of an elastic material; a thermal printing head facing said platen roller and arranged within a longitudinal range in the axial direction thereof; a pair of drums having a high rigidity arranged in parallel on both sides in the axial direction of said platen roller and provided as separate independent members with respect to said platen roller, said drums being positioned such that both side sections of the printing medium reach respective peripheral surfaces thereof and having a circumference sufficient to allow an entire length in the feed direction of the printing medium to be wound around the drums, said platen roller having a diameter smaller than a diameter of said drums and a platen roller surface not protruding beyond said drums and at the same level with the peripheral surfaces of the drums at the position where the platen roller faces said thermal printing head; a means for driving said drums; and printing medium retaining means arranged around the respective outer peripheries of said drums and adapted to continuously retain both side sections of the printing medium in such a manner that the retaining means are movable with respect to said peripheral surfaces, said side sections of the printing medium being in contact with the respective outer peripheries of said drums and being held between said printing medium retaining means and said outer peripheries of said drums.

5,062,724

METHOD OF MAGNIFYING A BIT MAP FONT DATA IN A HORIZONTAL DIRECTION

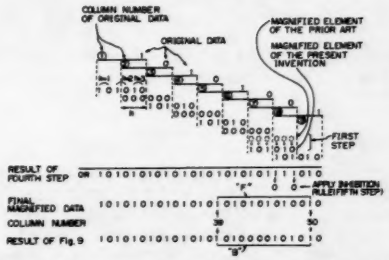
Shinichi Iizuka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 27, 1989, Ser. No. 302,390

Claims priority, application Japan, Jan. 29, 1988, 63-020823

Int. Cl.[5] B41J *5/30*

U.S. Cl. 400—121 **3 Claims**



1. A method of processing original bit map font data for magnification, by a predetermined magnification factor in a horizontal direction, comprising:

a first, data preprocessing step of reducing the number of successive "0's" in a portion of the bit map font data, which portion represents a solid line in the horizontal direction and is to be magnified by the predetermined magnification factor, to not more than a first predetermined number, by replacing each of one or more of the "0's" in said portion with a "1" so that the resulting number of successive "0's" in said portion is not more than said first predetermined number of successive "0's", said first predetermined number being determined in accordance with limiting the number of successive "0's" in the corresponding, magnified portion of the magnified bit map font data to not more than a second predetermined number; and

a second step of magnifying said bit map font data, after said replacement and the predetermined magnification factor, for half density printing in the horizontal direction, the second predetermined number being defined in accordance with avoiding the appearance of a blank segment in printing of the solid line in the horizontal direction, as represented by and in accordance with the corresponding, magnified portion of the magnified bit map font data.

5,062,725

TYPEWRITER OR PRINTER RIBBON AND METHOD FOR ITS MANUFACTURE

Ian W. Hogarth, Turriff, England, and Friedhelm Kiewning, Holo, Switzerland, assignors to Franz Buettner AG, EGG/ZH, Switzerland

Filed Sep. 19, 1990, Ser. No. 585,316

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1990, 4025758

Int. Cl.[5] B41J *32/00*

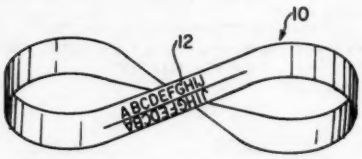
U.S. Cl. 400—195 **1 Claim**

1. A method for the manufacture of typewriter or printer ribbons comprising the steps of:

coating a support film with a plurality of inked strips offset relative to one another at equal, predetermined intervals and alternatively on the front and back surfaces of said film;

cutting said film into linear ribbons along a longitudinal direction such that only one half of said front surface and only one half of said back surface is coated with said inked strips;

rotating said ribbons individually through 180 degrees about its longitudinal axis; and



connecting the ends of said individual ribbons by adhesive means applied to surfaces of the ribbons not coated with ink.

5,062,726

PROCESS FOR SETTING A CUT PRINTING SHEET

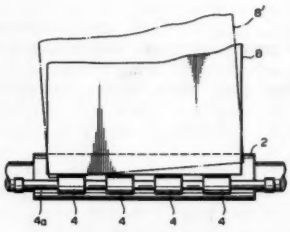
Mitsugu Inomata; Fumio Nakao, both of Kawasaki; Takashi Maekawa, Machida; Kaneastu Uchiyama, Hachioji; Tetsu Endo, Komae; Kazuo Nobue, Okayama; Masaki Shimazaki, Kawaguchi, and Shigeki Idouji, Inagi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 279,258, Dec. 1, 1988, abandoned, which is a continuation of Ser. No. 927,974, Nov. 7, 1986, abandoned. This application Oct. 17, 1989, Ser. No. 423,597

Claims priority, application Japan, Nov. 9, 1985, 60-249940

Int. Cl.[5] B41J *13/26*

U.S. Cl. 400—630 **3 Claims**



1. A process for feeding a cut sheet into a printer and aligning said cut sheet with said printer for printing, said printer comprising a cylindrical platen for supporting and feeding the printing sheet, at least one pinch roller, in at least a cut sheet printing mode of said printer, in resilient contact with said platen to cooperate therewith to feed the cut sheet, and an inclined sheet guide on which a cut sheet is loaded, wherein a leading edge of said cut sheet is inserted into a space between said platen and said pinch roller so that the cut sheet is ready to be compulsorily fed by said platen and said pinch roller, means for indicating that a cut sheet is loaded on said sheet guide and means for driving said platen characterized in that, said cut sheet feeding and aligning process comprises the steps of loading a cut sheet on said inclined sheet guide so that said cut sheet is freely supported on said sheet guide and said leading edge thereof is inserted into said space but not pinched between said platen and said pinch roller, rotating said platen in the reverse direction by a predetermined amount of rotation and pushing up said cut sheet in gravity contact at said leading edge with said platen rotating in said reverse direction to correct the posture of said cut sheet on said sheet guide and align the leading edge of said cut sheet with said platen and then rotating said platen in the forward direction and drawing said correct posture cut sheet between said forward direction rotated platen and said pinch roller and setting said cut sheet at a pre-set print start line position.

5,062,727

WRITING TOOL

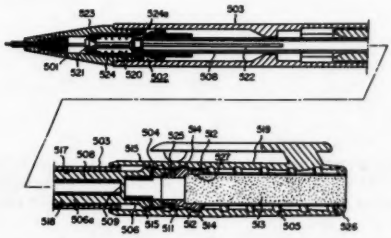
Shubei Kageyama; Toshihiko Kageyama; Youichi Nakazato, and Yoshihide Mitsuya, all of Kawagoeshi, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Division of Ser. No. 255,101, Oct. 7, 1988. This application Nov. 21, 1988, Ser. No. 274,297

Claims priority, application Japan, Oct. 9, 1987, 62-155300[U]; Oct. 9, 1987, 62-155301[U]; Oct. 9, 1987, 62-155302[U]; Nov. 6, 1987, 62-170189[U]; Nov. 6, 1987, 62-170190[U]; May 18, 1988, 63-66194[U]

Int. Cl.[5] B43K *29/02, 21/16, 21/08*

U.S. Cl. 401—52 **4 Claims**



1. A writing tool comprising; an outer sleeve; a writing shaft having a head member on one end and a container being inserted in said outer sleeve; a tubular cap mounted on said outer sleeve; said tubular cap having a spiral shaped groove on an inner surface thereof extending from a stepped portion at one end of said tubular cap to a portion having a larger inside diameter at the other end of said tubular cap; a tubular body in said outer sleeve having a bearing surface engaging an end of said container on said writing shaft; said tubular body being axially movable and locked against rotational movement by means on an inner surface of said outer sleeve; an elongated slit in said tubular body; a stick-shaped object holder being inserted in said tubular body and having a projection engaging said elongated slit; said elongated slit allowing axial movement of said stick-shaped object holder while preventing rotational movement; said projection engaging said spiral groove on the inside surface of said tubular cap for axial movement when said tubular cap is rotated.

5,062,728

DENTIFRICE DISPENSING TOOTHBRUSH WITH REPLACEABLE CARTRIDGE

Youti Kuo, 88 Foxbourne Rd., Penfield, N.Y. 14526

Filed Jul. 31, 1990, Ser. No. 563,307

Int. Cl.[5] B43K *5/06, 5/18;* **A46B** *11/00*

U.S. Cl. 401—176 **16 Claims**

1. A dentifrice dispensing toothbrush comprising:

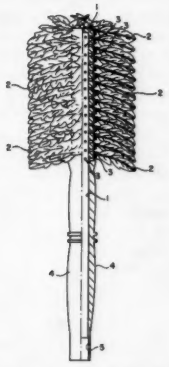
a. a housing having a body and a neck;
b. a reservoir situated in the body of the housing;
c. a removable cartridge positioned within the reservoir for storing dentifrice material, said removable cartridge comprising a hollow cylinder and a follower disc having a shape which is conformable to the shape of the cylinder base;
d. pumping means positioned within the housing and comprising a piston with an orifice for applying a pumping force to the dentifrice material to cause a controlled quantity of it to flow from the reservoir and through the orifice;
e. a brush head comprising a platform with an opening therethrough and a series of bristles which are attached to the platform;
f. a plunger for driving the piston and being slidably attached to the neck of the housing and to the brush head, said plunger being comprised of a hollow conduit having one of its ends in communication with the piston orifice and its remaining end in communication with the opening in the platform of the brush head, whereby dentifrice material flows through the hollow conduit and through the opening in the platform to the brush head when a pumping force is applied; and
g. locking means for preventing movement of the piston when a pumping force is applied and the follower disc is at its terminal position, said locking means comprising a spacer which is in simultaneous contact with the piston and the follower disc when the follower disc is at its terminal position.

5,062,729

COMBINATION OF CAR WASHING BRUSH AND DUSTER UTILIZING FEATHER OF WATERFOWLS

Mitsuhiro Yamamoto, 1487-8, Ooaza Shiwanini, Shiwa, Higashi Hiroshima shi, Hiroshima, Japan

Filed May 14, 1990, Ser. No. 523,396
Int. Cl.[5] A46B *11/04;* A47L *13/22*
U.S. Cl. 401—287 **2 Claims**



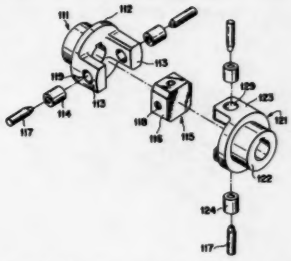
1. A combination of a car washing brush and duster utilizing feather of waterfowls comprising;
a stem made of a pipe and having distal and proximal halfs, said distal half of said stem having a number of water fountain holes, and said proximal half being served as a grip;
a dusting portion provided substantially on said distal half of said stem and made of feather of waterfowls; and
a water hose insertion hole provided at a proximal end of said proximal grip;
wherein wax is sprayed to said feather of waterfowls upon applications.

5,062,730

UNIVERSAL JOINT

Hiroyasu Tomii, Kawaguchi, and Yukio Kaneko, Yono, both of Japan, assignors to Nippon Piston Ring Co., Ltd. and Kay Seven Co., Ltd., both of Tokyo, Japan

Filed Aug. 7, 1990, Ser. No. 563,388
Claims priority, application Japan, Aug. 14, 1989, 1-207897
Int. Cl.[5] F16D *3/00*
U.S. Cl. 403—57 **3 Claims**



1. In a universal joint for use with a first and second rotation shaft, said universal joint including a first joint body provided with a first cylindrical hub portion and a first yoke portion, a second joint body provided with a second cylindrical hub portion and a second yoke portion, and a coupling member for coupling together the first and the second yoke portions therethrough, the improvement comprising:
the first and second yoke portions (**113, 123**) being provided integrally with the first and second hub portions (**112, 122**), respectively, and extending from diametrically opposite sides of the hub portions toward each other in axial directions thereof, the first and second yoke portions being formed with first and second pairs of bearing holes (**119, 129**);
first and second pairs of open ended sleeve members (**114, 124**) force-fittable with the first and second pairs of bearing holes, respectively;
the coupling member (**115**) comprising a rectangular segment (**116**) having four side walls formed with holes (**118**), and four pins (**117**) provided separately from the rectangular segment (**116**) prior to assembly and forcibly fittable into corresponding ones of said holes (**118**) to provide the coupling member (**115**) with a cruciform configuration upon assembly, each of the pins (**117**) being rotatably and axially slidably engaged with each of the sleeve members (**114**), **124**) so as to absorb force generated by an arrangement of said first and second rotation shafts, whereby said first and second joint bodies (**111, 121**) are coupled together by the coupling member (**115**).

5,062,731

LOCKABLE/UNLOCKABLE PIVOTED CONNECTION APPARATUS

Donald M. MacMillan, 26607 30A Ave., Aldergrove, B.C., Canada V0X 1A0

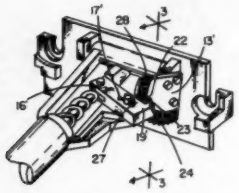
Filed Feb. 8, 1990, Ser. No. 476,741
Int. Cl.[5] F16C *11/10*
U.S. Cl. 403—96 **1 Claim**

1. Apparatus comprising a first bracket connected to a second bracket by a pivotable connection having a pivot pin with end play which allows relative movement between said first and second brackets, said pivot pin having a centerline, said apparatus further comprising:
a plate having a circular segment configuration with a center, a first side and a second side and being attached to said first bracket with said plate perpendicular to said centerline and with said center at said centerline, said second side being provided with a plurality of radial serrations,

a backstop element being attached to said first bracket in close proximity to said first side of said plate,

a clamping mechanism attached to said second bracket and having an adjustable part, said adjustable part having a plurality of points and being attached to said mechanisms such that one of said points is in close proximity to face said plurality of radial serrations on said second side of said plate,

whereby when said clamping mechanism is operated and said point is moved against said plate and said plate is moved against said backstop element so that relative motion is prevented between said first and second brackets,



and whereby said adjustable part having said plurality of points being adjustable with any one of said plurality of points in said close proximity to said plurality of radial serrations on said second side of said plate,

said backstop element further comprising a set screw having a longitudinal axis and an end portion, said axis being perpendicular to said plate, said end portion of said set screws being in close proximity to said first side of said plate and adjustment of said set screw adjusts the proximity of said backstop element to said first side and said end play allows one of said points to engage one of said plurality of radial serrations of said second side of said plate.

5,062,732

TUBULAR WELDED RAILING SYSTEM

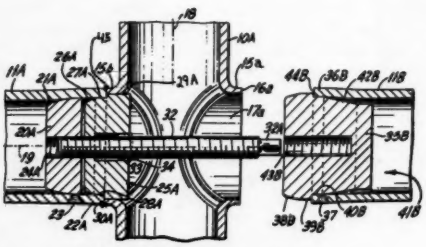
John E. Ballerstein, Fredericksburg, Va., assignor to Standard Steel Rail Technology, Harrison, N.Y.

Continuation-in-part of Ser. No. 341,937, Apr. 21, 1989, Pat. No. 4,952,092. This application Aug. 6, 1990, Ser. No. 563,268

The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.

Int. Cl.[5] F16B *7/08*

U.S. Cl. 403—174 **5 Claims**



1. A metal tube railing system comprising:

(a) a plurality of vertically aligned metal tubular posts each post having an outer diameter and at least one circular annular boss having substantially the same outer diameter as said post and having a flat annular lip, said boss being formed from said post and being integral therewith;

(b) a plurality of tubular metal side rails extending between said posts with each rail having opposite ends, the outer diameter of each of said side rails being the same as the outer diameter of said annular lip of said boss and both ends of each rail having a flat annular edge;

(c) a circular ring like weld means to join said side rail edges and said boss flat annular lips to thereby form circular weld joints.

5,062,733

JOINING ELEMENT FOR BEAMS

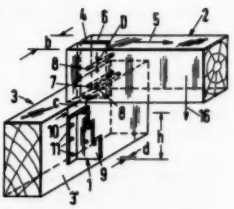
Yanbo Cholid, Bremen, Fed. Rep. of Germany; Trygve Theordorsen, Jar, Norway, and Jurgen Wilhelmi, Syke - Wachendorf, Fed. Rep. of Germany, assignors to Bulldog Beratungs- und Vertriebs-GmbH, Syke, Fed. Rep. of Germany

Filed May 3, 1990, Ser. No. 517,680

Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914618

Int. Cl.[5] F16B *7/08*

U.S. Cl. 403—189 **17 Claims**



1. Joining element made of metal, to connect the end face of a first beam to a second beam running crosswise to this first beam, or to another structural component, wherein the first beam's end section, which is to be connected to the second beam, is provided with an essentially centered vertical slot running in the longitudinal direction of the first beam from its end face that is to be connected, and with several drill holes disposed crosswise to and in the vicinity of the slot, in each of which a rod-shaped fastening means extending essentially across the width of the first beam, such as a dowel pin or the like, is disposed or is to be disposed, with at least one connecting flange protruding from the connecting surface of the second beam in the longitudinal direction of the first beam and to be attached to the second beam with a holding flange, the dimensions of which connecting flange essentially match the corresponding dimensions of the slot, and which connecting flange is provided with receiving openings each of which is to accept one rod-shaped fastening means disposed in the first beam; characterized in that at least one first receiving opening (**12.1**) is dimensioned larger, at least in the longitudinal direction (**5**) of the first beam (**2**), than the cross-section, extending in this direction, of the rod-shaped fastening means (**8**) to be disposed in this first receiving opening (**12.1**), by so much that this fastening means is not engaged, either during/after assembly or when the first beam (**2**) is put under load, with at least one side wall (**15** and/or **14**) of the first receiving opening (**12.1**) running crosswise to the side wall (**13**) of the first receiving opening (**12.1**) that supports the rod-shaped fastening means (**8**).

5,062,734

SHAFT COUPLING DEVICE

David G. Vanzee, and Douglas A. Ostlind, both of Rte. 3, Box 875, Rd. 97, Woodland, Calif. 95695

Filed Nov. 8, 1990, Ser. No. 610,741

Int. Cl.[5] F16B *2/02*

U.S. Cl. 403—313 **22 Claims**

4. A shaft coupling device for rigidly connecting two shafts for mutual rotation comprising, in combination:

a first sleeve portion with a hollow inner bore,

a second sleeve portion juxtaposed with said first sleeve portion and having a different size hollow inner bore than said hollow inner bore of said first sleeve portion, and

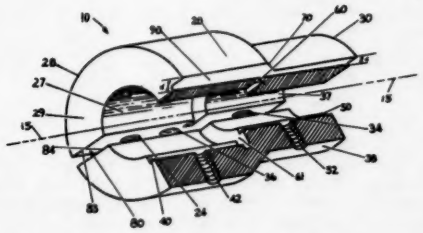
a means for attaching both said first sleeve portion and said second sleeve portion of said coupling device onto a first

shaft of one size complemental to said first sleeve bore and onto a second shaft of another size complemental to said second sleeve bore;

whereby two rotating shafts of distinct sizes may be rigidly coupled together;

and wherein said inner bore of said first sleeve has a keyway formed in an inner surface of said inner bore and said inner bore of said second sleeve has a separate keyway formed in an inner surface of said inner bore;

and wherein said keyways are rectangular cross-section channels of constant depth which run from a first end and a second end longitudinally along the entirety of said first sleeve portion and second sleeve portion,



whereby keys of complemental shape to said keyways may fit within said keyways and also within two similar keyways formed in the shafts restricting the shafts and said first sleeve and said second sleeve from rotation relative to each other;

and wherein the keys are held in place by a plurality of key screws which fit within threaded keyway holes which extend radially through said first sleeve and said second sleeve from an outer surface to within said keyways,

whereby when the keys are in place within said keyways said key screws will contact said keys with a tip thereof, thereby preventing the keys from moving longitudinally.

5,062,735

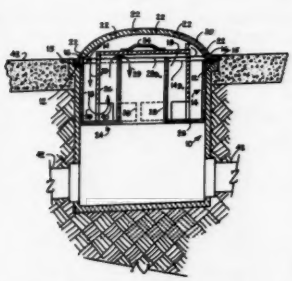
SELF SEALING DOMED SEWER COVER ASSEMBLY

Carl J. Gaudin, P. O. Box 74823, Baton Rouge, La. 70874

Filed Dec. 4, 1989, Ser. No. 445,766

Int. Cl.[5] E02D *29/14*

U.S. Cl. 404—25 **10 Claims**



1. A self sealing sewer cover assembly for preventing gases from escaping from a sewer inlet level with the ground comprising:

a. insert means having a top end and a bottom end for connection to a sewer inlet having generally vertical interior walls, said insert means having generally vertical walls on the exterior thereof for parallel alignment with said generally vertical interior walls of said sewer inlet,

b. trough means connected to said bottom end of said insert means and extending completely around the interior of said generally vertical walls of said insert means for containing water, said trough means having an inner generally vertical wall defining an opening through which water overflowing from said trough means can flow, said inner generally vertical wall of said trough means having a height extending to the level of the ground in which the sewer inlet is located to maintain the level of liquid in said insert means at the level of the ground surrounding the said sewer inlet,

c. a lid means lying in said trough and over and around said opening to prevent gases from traveling through said opening when said trough means is filled with water while permitting liquids to flow through said opening, and

d. a dome shaped cover means lying on top of said insert means, said cover means having a plurality of channels therein through which liquids may flow.

5,062,736

SNOW MELTING METHOD UTILIZING HEAT RETAINING FUNCTION OF UNDERGROUND AQUIFER WITHOUT SPRINKLING WATER

Kohei Katsuragi, and Takayuki Hiyama, both of Yamagata,, Japan, assignors to Nihon Chikasui Kaihatsu Kabushiki Kaisha, Yamagota, Japan

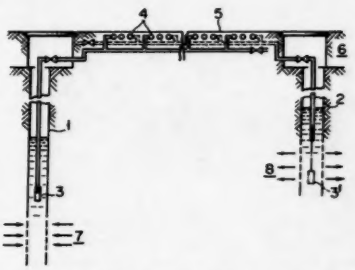
Filed Jun. 19, 1989, Ser. No. 368,409

Claims priority, application Japan, Aug. 8, 1988, 63-197688

The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.[5] F24J *3/08*; F28D *7/12*

U.S. Cl. 404—72 **2 Claims**



1. A method of melting snow lying on a structure above the ground by utilizing a heat retaining function of an aquifer located in a deep region of the ground, said method comprising the steps of:

(a) pumping up through a first artesian well, in a cold snow season, underground water warmed by geothermy to a temperature of from 15° to 18° C. in an aquifer from 50 to 200 meters below the surface of the ground;

(b) causing the pumped up water to flow at a speed of 1.5 meters per second through pipe means laid in said structure to store heat of the underground water in the structure and to transfer the heat of the underground water to snow lying thereon to melt the snow;

(c) returning through a second artesian well the underground water once used and cooled by heat transfer to a temperature from 7° C. to 8° C. into a second aquifer which has a depth of at least two-thirds of said first mentioned aquifer;

(d) storing the underground water returned through the second well in the second aquifer to warm the returned underground water in about six months to a temperature from 15° to 18° C. by the heat retaining function of the second aquifer;

(e) pumping up through the second artesian well, in the next cold snow season, the underground water in the second aquifer;

(f) causing the pumped up water from the second artesian

well to flow at a speed of 1.5 meters per second through said pipe means to melt the snow on said structure;

(g) returning the underground water used and cooled in the pipe means for the second time into the first aquifer through the first artesian well;

(h) storing the underground water returned through the first well in the first aquifer to warm the returned water by the heat retaining function of the first aquifer; and

(i) repeating the above steps every two years.

5,062,737

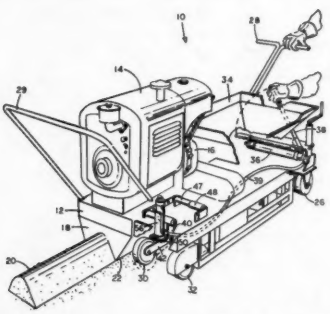
POWERED HEIGHT CHANGER FOR IMPROVED POWER CURBER

Terry G. Samuels, 489 Pine Hill Blvd., Geneva, Fla. 32732

Continuation-in-part of Ser. No. 167,955, Mar. 14, 1988, abandoned. This application Apr. 21, 1989, Ser. No. 341,373

Int. Cl.[5] E01C *19/52*

U.S. Cl. 404—98 **15 Claims**



1. A curb laying machine comprising a chassis, steerable front wheels supporting a forward portion of said chassis, and at least one rear wheel mounted on a rearward portion of said chassis, an engine carried on said chassis, and a curb mold mounted on the underside of a rear portion of said chassis with its lower edges normally in ground contact, said curb mold containing a rotatable auger driven in rotation by the engine, with the rotation of the auger bringing about the extrusion of curbing through said curb mold onto the ground as the machine moves slowly forward, the improvement comprising a height changing mechanism in operative relationship with said rear wheel, said rear wheel being located in the vicinity of said curb mold, said height changing mechanism including the use of an extensible fluidic actuator under control of an operator of said machine, said actuator being mounted in an operative relationship with said rear wheel, said actuator serving, when caused by the machine operator to extend, to bring about a degree of lifting of the rear portion of said chassis, thus to remove the lower edges of said curb mold from ground contact, and thereby enabling the operator to turn or move said machine to a new operative position, and a bleed valve under control of the operator, located in the fluid line in which said extensible fluidic actuator is operatively disposed, the opening of said bleed valve enabling said extensible fluidic actuator to rapidly return, under the bias provided by the weight of said chassis, to its non-extended condition, thereby enabling the lower edges of said curb mold to return promptly into contact with the ground, whereby the operator can immediately resume the curb laying operation in the new operative position.

5,062,738

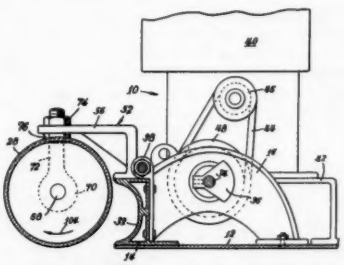
ROLLER SCREED

Joe M. Owens, 842 Lake Holiday Dr., Sandwich, Ill. 60548

Filed Apr. 17, 1990, Ser. No. 510,008

Int. Cl.[5] E01C *19/00*

U.S. Cl. 404—114 **11 Claims**



1. A portable screed for smoothing and leveling an area of freshly poured concrete, the screed having an elongated screed plate with a flat bottom bearing surface and having means extending at one side of the screed plate along the length of the screed plate for accumulating and transporting quantities of plastic concrete, the improvement comprising

a. a cylindrical horizontal smoothing roller secured to the screed plate, said roller having a length substantially coextensive with the length of the screed plate,

b. means rigidly mounting said roller in relation to said screed plate immediately adjacent and in front of said means for accumulating and transporting, such that when the screed is used to smooth and level concrete, said roller encounters portions of plastic concrete before said means for accumulating and transporting encounters such portions,

c. means for adjusting the elevation of said roller relative to the bottom bearing surface of said screed plate, and

d. means for rotating said roller about its axis in a direction opposite to the direction of travel of the screed.

5,062,739

ZIGZAG BREAKWATER

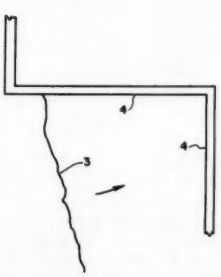
Albrecht Klockner, Spreitgen, D-5223 Numbrecht, Fed. Rep. of Germany

Continuation of Ser. No. 544,016, Jun. 27, 1990, abandoned, which is a continuation of Ser. No. 810,288, Jan. 28, 1986, abandoned. This application Feb. 19, 1991, Ser. No. 657,378

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235602

Int. Cl.[5] E02B *3/06*

U.S. Cl. 405—21 **1 Claim**



1. A zigzag breakwater with essentially straight-line stationary zigzag elements embedded into the sea bottom and whose side walls face the attacking waves essentially run perpendicular to the calm water surface, characterized by the fact that the

side walls form right angles with each other, the length (l) of the side walls is at least 5 to 8 times as great or greater than the depth of water (d) and that the total height (h) of the wave-reflecting side walls (4) is 2 to 2.5 times greater than the depth of the water wherein d is measured from a breakwater grounding to a calm water level at high tide.

5,062,740

LAMINATE FORMING AND APPLYING APPARATUS AND METHOD AND PRODUCT THEREFROM

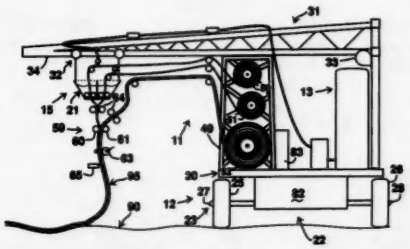
Le Roy Payne, 3300 Nicholas La., Molt, Mont. 59057

Division of Ser. No. 417,501, Oct. 5, 1989, Pat. No. 4,955,760, which is a continuation-in-part of Ser. No. 235,205, Aug. 23, 1988, Pat. No. 4,872,784. This application Aug. 27, 1990, Ser. No. 572,397

The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.

Int. Cl.[5] E01C *19/00*; E02B *11/02*

U.S. Cl. 405—270 **19 Claims**



1. A method of continuously forming a continuous structural laminate and applying said laminate to a surface including the steps of dispensing continuously a first solidifiable liquid polymeric mixture uniformly to a continuously advancing first porous blanket, dispensing continuously a second solidifiable liquid polymeric mixture uniformly to a continuously advancing second porous blanket, dispensing continuously an individually pre-selected solidifiable liquid polymeric mixture to each remaining continuously moving porous blanket, combining said advancing porous blankets into a single laminate with each blanket closely adjacent to adjoining blankets, monitoring the rate of advance of each blanket, coordinating said rate of advance with the flow rate of the liquid polymeric mixture thereon, monitoring the relationship of the blankets to one another in the combined laminate, immediately applying the freshly formed laminate to a surface continuously while said laminate is deformable and adhesive, simultaneously conforming said laminate to said surface configuration and setting said laminate in the configuration thereof.

5,062,741

CABLE WITH RADIAL ELEMENTS FOR CONVEYING MATERIALS BEHAVING AS FLUIDS THROUGH DUCTS

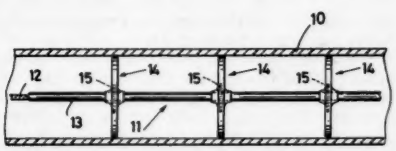
Camillo Pirovano, Località Cavigiolo, 22052 Cernusco Lombardone (Como), Italy

Filed Apr. 12, 1990, Ser. No. 507,780

Claims priority, application Italy, Apr. 14, 1989, 20147 A/89

Int. Cl.[5] B65G *53/40*

U.S. Cl. 406—76 **8 Claims**



1. In a conveyor apparatus for conveying materials behaving substantially like fluids through a tubular duct with a flexible cable having a plurality of conveying elements extending substantially radially therefrom and fixed along the length thereof at spaced intervals, the improvement comprising a plurality of spaced pins that pass through the cable with either end thereof protruding radially outward from the cable in opposite directions, and a plurality of conveying elements, each of which is molded in place around a pin and the adjoining portions of the cable so as to completely embed the pin within the element.

5,062,742

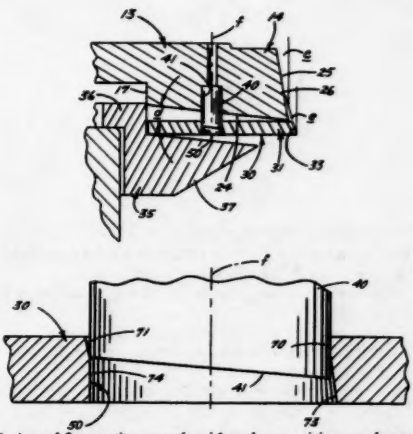
ANGULAR INTERLOCK FOR THE REPLACEABLE WAFER OF A SHAPER CUTTER

Edward W. Haug, Rockford, Ill., assignor to Pfauter-MAAG Cutting Tools Limited Partnership, Rockford, Ill.

Filed May 24, 1990, Ser. No. 528,241

Int. Cl.[5] B23F *21/28*

U.S. Cl. 407—28 **11 Claims**



1. A tool for cutting metal, said tool comprising an elongated body having a circular cross-section and a forward end surface, said forward end surface being generally frustoconical, a plurality of radially projecting teeth formed on the periphery of said body adjacent said forward end surface and spaced angularly around said body, a thin and flexible sheet metal wafer located forwardly of said forward end surface of said body and having a plurality of radially projecting cutting teeth spaced angularly around its periphery, the number of cutting teeth on said wafer being equal to the number of teeth on said body, each cutting tooth on said wafer being alined angularly with one of the teeth on said body, the cutting teeth on said wafer being larger at their ends, sides and roots than the corresponding teeth on said body whereby the cutting teeth on the wafer extend slightly beyond the ends, sides and roots of the teeth on said body, means for holding said wafer in a flexed condition and in rigid face-to-face conformity with said frustonical forward surface whereby the cutting teeth on said wafer are backed by the teeth on said body, and anti-rotation means for preventing said wafer from turning relative to said body, said anti-rotation means comprising a hole in said body and an alined circumferentially continuous hole in said wafer, a pin fixed within the hole in said body and projecting into the hole in said wafer, the hole in said wafer having first and second end portions, the hole in said wafer being shaped such that the first end portion of such hole engages said pin around one side of the pin and is spaced from the pin around the opposite side of the pin while the second end portion of such hole engages said pin around said opposite side of the pin and is spaced from the pin around said one side of the pin.

5,062,743

DRILLING DEVICE

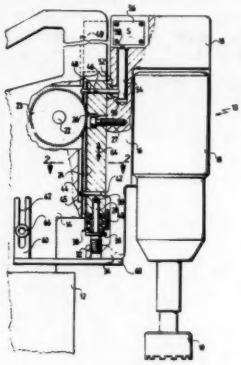
Dietrich Wieland; Martin Kalb, both of Wendelstein; Werner Grupp, Vaihingen, and Michael Nothofer, Kornwestheim, all of Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Fed. Rep. of Germany

Continuation-in-part of Ser. No. 335,609, Apr. 10, 1989, abandoned. This application Jul. 10, 1990, Ser. No. 550,731

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1990, 9010313

Int. Cl.[5] B23B *47/24, 45/14*

U.S. Cl. 408—6 25 Claims



1. A drilling device comprising

a foot having a fixing device acting with a holding force on an object for fixing said foot on said object,

a holder displaceable with respect to said foot in a feed direction,

a drilling machine tool carried by said holder,

a feed drive comprising an electromotor for driving said holder in said feed direction,

a controlling means for controlling the feed velocity of the feed drive in response to said holding force of said fixing device.

5,062,744

APPARATUS FOR CONFIRMING MOVEMENT OF TAP WHEN RIGID TAPPING

Kosei Nakamura, Hino, and Kazuhisa Numai, Yamanashi, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

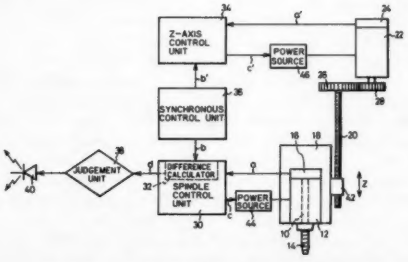
PCT No. PCT/JP89/00747, § 371 Date Mar. 26, 1990, § 102(e) Date Mar. 26, 1990, PCT Pub. No. WO90/01388, PCT Pub. Date Feb. 22, 1990

PCT Filed Jul. 27, 1989, Ser. No. 474,758

Claims priority, application Japan, Aug. 3, 1988, 63-192824

Int. Cl.[5] B23G *1/44*

U.S. Cl. 408—8 1 Claim



1. An apparatus for confirming movement of a tap when rigid tapping with a machine tool having a built-in spindle motor for directly driving a spindle to rotate and a Z-axis motor for driving the spindle to move linearly along an axis of the spindle, comprising:

a detecting means for detecting a rotation of said spindle;

a spindle control means for outputting a signal to control a rotation of said spindle motor according to a signal output from said detecting means;

a Z-axis control means for outputting a signal to control a rotation of said Z-axis motor;

a synchronous control means for outputting each synchronous signal to said spindle control means and said Z-axis control means, respectively; and

a judgement means for judging a follow-up ability of said spindle motor, by comparing a prescribed reference signal with a signal of a rotational error of said spindle calculated by said spindle control means, using the synchronous signal from said synchronous control means and the signal from said detecting means.

5,062,745

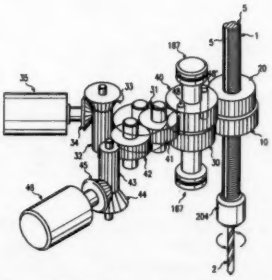
MECHANICAL PECK DRILL AND METHOD

Richard E. Eckman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 30, 1989, Ser. No. 374,306

Int. Cl.[5] B23B *47/34*

U.S. Cl. 408—17 26 Claims



1. A control system for controlling an apparatus used for reciprocating a tool, held in a spindle, into and out of a workpiece wherein the apparatus includes a reciprocator for advancing the tool at either of at least two different advancement speeds with respect to the workpiece and retracting the tool with respect to the workpiece, a rotator for turning the tool, and a drive train for providing power to the reciprocator and the rotator and including at least one power means for rotating in a first direction to cause the reciprocator to advance and retract the tool at a predetermined one of the two different advancement speeds and in a second and opposite direction to cause the reciprocator to retract the tool, said control system comprising:

a first sensor operatively positioned to sense the position of the tool and to signal the drive train that the tool is near a position where the tool will be in contact with the workpiece;

a timer operatively connected to said first sensor to receive a signal therefrom and provide a signal to the drive train that the tool has been advancing in contact with the workpiece for a selected period of time, the drive train then providing power to the reciprocator which then retracts the tool from the workpiece; and

a second sensor operatively positioned to sense the position of the tool and to signal the drive train that the tool has retracted to a first predetermined position, the drive train then providing power to the reciprocator which then advances the tool until the drive train is signaled by said first sensor that the tool is near a position where the tool will be in contact with the workpiece, the drive train then

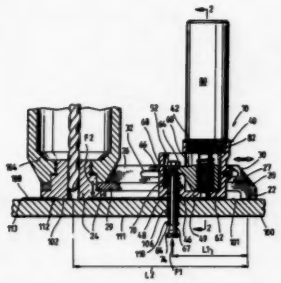
providing power to the reciprocator which then changes the speed of advancement of the tool to another advancement speed, said second sensor comprising a switch means for changing the direction of rotation of the at least one power means of the drive train, said switch means comprises a valve member which is shifted to change the direction of rotation of the at least one power means when said valve member is contacted by a first collar on the spindle.

5,062,746

CLAMPING ATTACHMENT FOR PORTABLE DRILLS

Edwin J. Deremo, Lexington, S.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 5, 1991, Ser. No. 664,701
Int. Cl.[5] B23B *45/14*
U.S. Cl. 408—79 **3 Claims**



1. A device for selectively clamping a portable drill to a work piece comprising:

a foot member, said foot member having:

means for engaging the portable drill;

a contact pad for placing pressure on the surface of the work piece;

a substantially horizontal guide path;

a housing constructed and arranged to be positioned within said substantially horizontal guide path, said housing having:

mounting means for a source of rotational torque;

a hollow collet member constructed and arranged to extend outwardly from said housing;

means for expanding said hollow collet member contained within said housing, said means for expanding said hollow collet member having:

a mandrel constructed and arranged to pass through and expand said hollow collet member;

means for converting said rotational torque to substantially vertical movement of said mandrel;

whereby when said mandrel is moved in a substantially vertical direction, said hollow collet member is expanded and pressure is placed on the surface of the work piece by said contact pad, thus selectively positioning said means for engaging the portable drill with respect to the work piece.

5,062,747

JIG-BORING DEVICE

Ming-Tang Chen, No. 23-4, Alley 21, Lane 205, Yong Xing Road, Dali, Taichung, Taiwan

Filed Jan. 10, 1990, Ser. No. 463,195
Int. Cl.[5] B23B *47/28*
U.S. Cl. 408—115 R **3 Claims**

1. A jig-boring device, comprising:

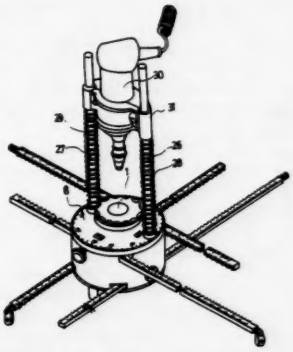
a hollow circular axle barrel, a bottom plate having a central opening, a lower gear having an extended portion, a fixed support, an upper gear having an extended portion, a lock nut, two pairs of measuring staff brackets, two pairs of parallel measuring staffs;

said hollow circular axle barrel being perpendicular to the central opening of said bottom plate, and surrounded by said lower gear, said fixed support, and said upper gear, and having male threads at its top outer periphery to securely thread with said lock nut;

said bottom plate, comprising a circular plate with the central opening connected to said axle barrel and having a symmetry of guide grooves as well as cross nut pieces in its upper area where one of said pair measuring staff brackets is connected thereby and is guided in its moving back or forth;

said lower gear, having a central opening surrounding said axle barrel, having its extended portion in its upper area to insert said fixed support above to get positioned thereby;

said fixed support, comprising a short cylindric block, fixed between said lower gear and said upper gear, and having a central opening surrounding said axle barrel, said support having a concave portion in its central upper and lower areas which corresponds to the extended portion of the lower gear and upper gear for them to insert, and having a symmetry of guide grooves and cross nut pieces in the upper area outside said concave portion where the other of said pair of measuring staffs make connection thereto;



an upper gear, which has all the same structure as said lower gear but having said extended portion in its lower area to insert into said fixed portion;

each of said measuring staffs comprising a longitudinal rack having a rectilinear shape, each staff having an upper outward face scaled with length scales while the upper inward face is a longitudinal rack rim, and said pairs of staffs are placed parallel beside the opposing two sides of said lower gear and upper gear, one pair perpendicularly crossing the other pair, and each staff having direction-turntable rest plates at an end for touching with a basic plane when in use;

said two pairs of measuring staff brackets comprising a U-support, a screw stem and a handlebar, connected to the symmetry of guide grooves and cross nut pieces provided in the upper areas of said bottom plate and fixed support respectively, so as to guide each said pair of measuring staffs inserted in their U-supports in their movement;

a cover plate, which by means of a central opening therein surrounds said axle barrel and is above the top of said fixed support;

said lock nut, screws to the male threads of the top outer periphery of said axle barrel; and

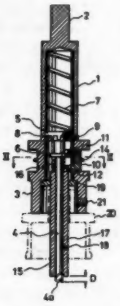
wherein said device measures bore center position on work objects.

5,062,748

SHANK STRUCTURE FOR ANNULAR HOLE CUTTER

Shigeru Kishida, Miki, Japan, assignor to ODSK Company, Limited, Hyogo, Japan

Filed Apr. 15, 1991, Ser. No. 684,786
Int. Cl.[5] B23B *51/04*
U.S. Cl. 408—206 4 Claims



1. A shank structure for annular hole cutter comprising a hollow-cylindrical body having a holder portion for holding an annular hole cutter at an end thereof, a center drill slidably inserted in an inner cavity of said body, and a spring disposed in said cavity for urging said center drill axially outwards, characterized by

A sleeve fit on said center drill and adapted to be axially slidable,

first clutch means responsive to the axial movement of said sleeve for inhibiting and allowing the axial movement of said center drill,

second clutch means responsive to the axial movement of said center drill for inhibiting and allowing rotation of said center drill,

wherein both axial movement and rotation of said center drill is inhibited by said first and second clutch means in the initial state and, when said body is rotated, said center drill first drills a center hole and, after drilling the center hole of a predetermined depth, said sleeve moves axially to release said first clutch means, thereby moving said center drill axially to release said second clutch means to stop rotation of said center drill.

5,062,749

TOOL COUPLER

Harold D. Sheets, 12556 White Chapel Ave., Baton Rouge, La. 70810

Filed Feb. 21, 1989, Ser. No. 313,582
Int. Cl.[5] B23B *31/10*
U.S. Cl. 408—240 15 Claims

1. A tool coupler, comprising:

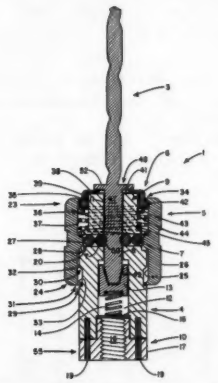
a. an elongated body having an upper end, a lower end, a first axial bore having a non-circular cross-section, said first axial bore extending at least partially through said body from said upper end toward said lower end, and at least one radial bore extending from said first axial bore to the exterior of said body;

b. a collar, positioned around said body and having an upper end, a lower end, an inner wall, an outer wall, an outer wall and an annular retaining flange extending radially from said inner wall, said retaining flange being alignable with said radial bore;

c. a means for gripping a tool shank, positioned in said radial bore and having a greater length than said radial bore such that when said retaining flange of said collar is aligned with said radial bore, said means for gripping a tool shank is urged at least partially into said radial bore;

d. a means for retaining said collar in position around said body, connected to said collar and said body;

e. a cap, positioned in said collar, said cap having an upper surface, an outer surface facing said inner wall of said collar, a lower surface and an axial opening at least as large as said aligned with said first axial bore of said body;



f. a first resilient means, positioned between said cap and said retaining flange of said collar, for urging axial separation between said retaining flange and said cap; and

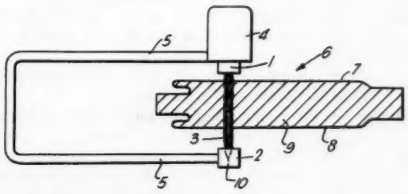
g. a means, connected to said upper end of said collar, for retaining said cap within said collar.

5,062,750

SANDWICH PANEL CUTTING METHOD AND MACHINE TOOL

Lukas Oosterhof, Zevenhizen, Netherlands, assignor to Hunter Douglas International NV, Curacao-Netherlands, Netherlands Antilles

Filed May 31, 1990, Ser. No. 530,359
Claims priority, application United Kingdom, Jun. 2, 1989, 8912705
Int. Cl.[5] B23B *51/08;* B23C *1/20, 3/00*
U.S. Cl. 409—132 16 Claims



1. A method of cutting a workpiece, to sever a part of the workpiece, said method comprising the steps of rotatably supporting an elongate milling cutter in bearings which are spaced apart in an axial direction of the cutter, said cutter having a longitudinal axis and an effective cutting length related to a thickness dimension of the workpiece to be cut, supporting the workpiece in cutting position relative to the cutter and effecting relative cutting sweep movement between the workpiece and the cutter, said relative movement taking place in at least one cutting direction transverse to the axis of the cutter, whereby a cut is made in the workpiece in the cutting direction wherein said cutter has a sharpened end and prior to making said cut, said sharpened end and a relevant one of said bearings are temporarily disengaged from one another, relative movement is effected between said workpiece and said cutter in the axial direction of said cutter to pierce through said

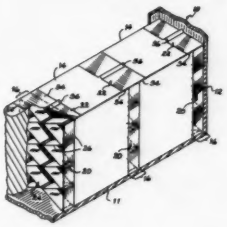
workpiece, and said cutter and said relevant bearing are then re-engaged for carrying out said cutting sweep movement.

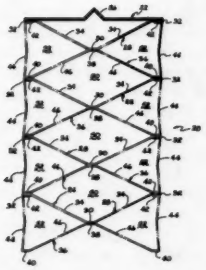
5,062,751

ECONOMY VOID FILLER

Henry L. Liebel, Cincinnati, Ohio, assignor to Shippers Paper Products Company, Loveland, Ohio

Filed Mar. 13, 1991, Ser. No. 669,105
Int. Cl.[5] B61D *45/00*; B32B *3/12*
U.S. Cl. 410—154 1 Claim





1. A collapsible and expandable void filler comprising a plurality of first and second corrugated panels alternately stacked one on another and adhered together, said first panel being generally V-shaped in the expanded condition and comprising a central glue section, a pair of glue flaps at the outboard edges thereof, and a pair of long panels extending therebetween, said second panel being generally W-shaped in the expanded condition and comprising a central glue section, a pair of lower side glue sections, a pair of upper glue flaps, a pair of long panels extending between said lower side glue sections and said pair of said upper glue flaps, and a pair of long panels extending between said lower side glue sections and said central glue section,

said central glue section of said first panel being adhered to said central glue section of said second panel,

said glue flaps of said first panel being laminated between the lower side glue section of said second panel and the upper glue flaps of an adjacent second panel,

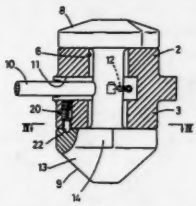
in the expanded condition in use said long panels of said first panel and said long panels of said second panel extending between said lower side glue sections and said central glue sections forming a vertical array of stacked diamond-shaped cells, and said pair of long panels extending between said lower side glue sections and said pair of upper glue flaps of said second section forming therewith a vertical array of stacked triangle-shaped cells adjacent to said diamond-shaped cells.

5,062,752

CONTAINER COUPLING DEVICE

Hiroyuki Takaguchi, Nagasaki, Japan, assignor to Taiyo Seiki Iron Works Co., Ltd., Osaka, Japan

PCT No. PCT/JP89/00096, § 371 Date Sep. 15, 1989, § 102(e) Date Sep. 15, 1989, PCT Pub. No. WO89/07079, PCT Pub. Date Aug. 10, 1989
PCT Filed Jan. 30, 1989, Ser. No. 415,229
Claims priority, application Japan, Feb. 4, 1988, 63-25452
Int. Cl.[5] F16B *21/00*
U.S. Cl. 411—347 18 Claims



1. A coupling device for coupling together containers such that the containers are maintained in a vertical stack, comprising:

an upper portion adapted for engagement in an engaging hole in a bottom surface of an upper container;

a horizontally elongated insertion shank mounted to said upper portion, said shank being rotatable about a vertical axis;

a horizontally elongated engaging body, adapted for engagement in an engaging hole in a top surface of a lower container, mounted to a lower end of said upper portion for rotation about said vertical axis relative to said insertion shank, said engaging body having opposing side faces and a horizontal cross section which is substantially similar to a horizontal cross section of said insertion shank such that said elongated engaging body and said elongated insertion shank can be vertically aligned;

a lever fixed for rotation with said engaging body;

spring means for biasing said engaging body to rotate relative to said insertion shank toward a locking position wherein said engaging body and said insertion shank are misaligned such that portions of longitudinal ends of said engaging body protrude beyond a periphery of said insertion shank;

rotation restriction means for restricting rotation toward said locking position of said engaging body relative to said insert shank such that a rotational torque in addition to that provided by said spring means is necessary to rotate said engaging body toward said locking position relative to said insertion shank beyond a predetermined point; and

additional torque providing means for providing additional torque to cause said engaging body to automatically rotate relative to said insertion shank toward said locking position beyond said predetermined point upon insertion of said engaging body into the engaging hole in the top surface of the lower container.

5,062,753

SURVEY NAIL

Joseph E. Begue, 2444 S. 8th St., Springfield, Ill. 62703

Filed Jan. 22, 1991, Ser. No. 644,278
Int. Cl.[5] F16B *15/00*, *15/02*
U.S. Cl. 411—470 5 Claims

1. A benchmark nail organization comprising, in combination,

a support truss, the support truss including a planar impact head surface and a main body support surface, the main body support surface arranged orthogonally relative to the planar impact head surface, and

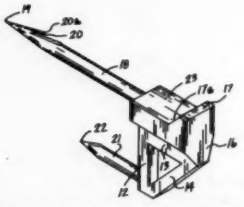
the support truss including a first spike extending orthogo-

nally relative to the support truss and longitudinally of the main body support surface, and

a second spike arranged orthogonally relative to the support truss spaced from and parallel to the first spike, and

wherein the first spike is defined by a first length and the second spike is defined by a second length, wherein the second length is less than that of the first length, and

wherein the first spike includes a pointed outer terminal end with a back cut recess directed into the first spike adjacent the outer terminal end, and a rearwardly directed projection overlying the recess oriented in an opposed orientation to the pointed outer terminal end of the first spike, and



wherein the truss includes a first leg, with the first leg integrally mounting the second spike orthogonally to a forward terminal end of the first leg, with the first spike orthogonally arranged adjacent to a rear end of the first leg, with the first leg integrally and orthogonally formed to a second leg, with the second leg including a main body support including a planar main body support surface formed on an exterior surface thereof, and a main body projection orthogonally oriented relative to the main body support formed at an upper terminal end of the main body support spaced from the first spike wherein the first spike is longitudinally aligned with the main body support.

5,062,754

BOOKLET, METHOD AND APPARATUS FOR PRODUCING THE SAME

Göran Bolin, Täby; Urpo Latvakangas, Saltsjö-Boo, and Jan Sabelström, Huddinge, all of Sweden, assignors to Bindomatic AB, Sweden

PCT No. PCT/SE87/00130, § 371 Date Sep. 8, 1988, § 102(e) Date Sep. 8, 1988, PCT Pub. No. WO87/05565, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 13, 1987, Ser. No. 246,298

Claims priority, application Sweden, Mar. 14, 1986, 8601216

Int. Cl.[5] B42L *11/00*

U.S. Cl. 412—4 **16 Claims**

1. Method of producing a folder or wrapper comprising two substantially parallel covers that are united with a spine at inner and outer pairs of crease lines, the spine being substantially perpendicular to the covers, and a strip of binder being rectangular or trapezoidal in cross-section and having top and bottom surfaces and two opposing longitudinal side edges, comprising the steps of attaching the strip at its bottom surface to the spine between the inner crease lines and activating substantially only the two opposing longitudinal side edges of the binder to bind the two opposing longitudinal side edges of the strip to the covers.

5,062,755

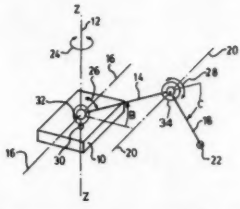
ARTICULATED ARM CONTROL

Peter D. Lawrence, and Robert V. Ross, both of Vancouver, Canada, assignors to MacMillan Bloedel Limited

Continuation of Ser. No. 158,731, Feb. 23, 1988, abandoned. This application Jul. 25, 1989, Ser. No. 384,912

Int. Cl.[5] B25J *3/00*

U.S. Cl. 414—4 **11 Claims**



1. A system for controlling the movement of an arm formed by a plurality of articulated interconnected arm segments mounted for movement on at least three separate axes one of which comprises a z axis to move a point located substantially adjacent to the free end of said arm selectively in substantially mutually perpendicular x, y and z directions, said x direction always being along a straight line extending substantially in the direction between said point and said z axis, said y direction being substantially along any selected arc of fixed radius around said z axis and said z direction being substantially parallel to said z axis, comprising a manually operated controller, a computer control means, independent means for moving said arm segments on each of said axes, said controller having x direction control means, y direction control means and z direction control means adapted to provide an independent x, y and z signal respectively to said computer control means, each said signal varying in accordance with displacement of its respective direction control means, said computer control means controlling said means to move said arm segments to move said point in solely a selected one of said x, y or z directions when said controller is activated to provide a signal to said computer control means for movement in solely the selected one of said x, y or z directions, respectively, said computer control means controlling said means to move said arm segments to move said point in said y direction at the same velocity for a given displacement of said y direction control means regardless of the position of said point relative to said z axis, said controller being positioned so that the direction of displacement of at least two of said independent x, y and z direction control means is manipulated substantially in the same respective x, y or z direction as the direction of movement of said point from the perspective of an operator operating said controller.

5,062,756

DEVICE FOR POSITIONING AND STABBING CASING FROM A REMOTE SELECTIVELY VARIABLE LOCATION

James R. McArthur, Tishimingo, Okla.; John Harrel, Box 850, Hwy. 76 South, Lindsay, Okla. 73052, and John Mayberry, Lindsay, Okla., assignors to John Harrel and Charlena Harrel, Lindsay, Okla., a part interest

Filed May 1, 1990, Ser. No. 517,857

Int. Cl.[5] B65G *47/08*

U.S. Cl. 414—22.51 **6 Claims**

1. A casing stabbing apparatus comprising:

an elongated boom having an inner first end and an outer second end;

mounting means pivotally connected to said inner first end of said boom for connecting said inner first end of said boom to a derrick, and permitting said boom to pivot about a horizontal and vertical axis;

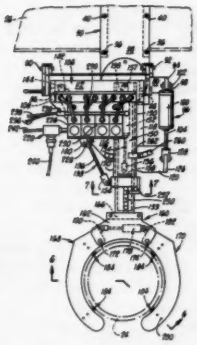
a yawing piston and cylinder subassembly connected to said boom for pivoting said boom from side-to-side about an axis extending perpendicularly to the longitudinal axis of the elongated boom, said yawing piston and cylinder subassembly including:

a yawing cylinder having one end connected to said mounting means at a location spaced from the inner first end of said boom, and having a second end; and

a piston rod extending from said second end of said yawing cylinder and having an end connected to said elongated boom between said inner first end and said outer second end, and extending at an acute angle to the longitudinal axis of said boom;

a boom elevating and lowering piston and cylinder subassembly liftingly connected to said boom for pivoting said boom about a horizontal axis to thereby cause arcuate upward movement of the outer second end of said elongated boom, said boom elevating and lowering piston and cylinder subassembly including:

an elevating and lowering cylinder having one end connected to said mounting means at a location spaced upwardly from the location where said inner first end of said boom is connected to said mounting means, and having a second end; and



a piston rod extending from said second end of said elevating and lowering cylinder and having an end liftingly connected to said elongated boom between the inner first end of said boom and the outer second end thereof;

a jaw-supporting bracket mounted on the outer end of said boom;

a pair of tubular jaw-receiving sleeves each having an opening at one end of the respective tubular sleeve for receiving a jaw;

a pivot bolt pivotally supporting and mounting each of said tubular jaw-receiving sleeves on an end of said supporting bracket so that said tubular jaw-receiving sleeves are located on opposite ends of said jaw-supporting bracket and pivotable with relation to said jaw-supporting bracket, said tubular sleeves being pivotally mounted by said pivot bolts on said bracket for pivotation about spaced parallel axes;

a jaw-actuating piston and cylinder subassembly interconnecting said jaw-receiving sleeves for pivoting said sleeves about said parallel axes at a time when said jaw-actuating piston and cylinder subassembly is actuated to extend or retract a piston rod forming a part of said jaw-actuating piston and cylinder subassembly;

a pair of opposed, spaced, arcuate jaws each having a concave inner side and a convex outer side, and each having one end portion thereof detachably mounted in one of said jaw-receiving tubular sleeves by slidable insertion on said end portion into the open end of the respective tubular sleeve thereby facilitating quick detachment and replacement with a jaw of a different size, and said arcuate jaws being movable with said sleeves during pivotation of the sleeves to converge the jaws toward each other and diverge the jaws away from each other for the purpose of engaging and releasing a section of casing; and

a plurality of bolts removably bolting each of said jaws in its respective jaw-receiving tubular sleeve for pivotal movement therewith.

5,062,757

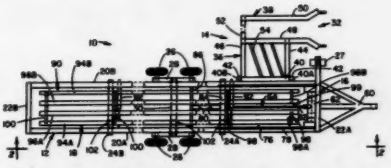
LARGE ROUND BALE HANDLING APPARATUS

R. Dale Eichenauer, Rte. 1, Box 120, Ingalls, Kans. 67853

Filed Jul. 2, 1990, Ser. No. 547,602

Int. Cl.[5] A01D *95/02*

U.S. Cl. 414—24.5 **16 Claims**



1. A large round bale handling apparatus, comprising:

(a) a mobile frame with a pair of elongated laterally-spaced longitudinal beams having upper surfaces for receiving and supporting large round bales in a row and for permitting sliding of bales rearwardly without obstruction by anything that might penetrate into the bales and cause tearing of plastic covers when applied around the bales;

(b) a bale pickup mechanism pivotally mounted to the mobile frame adjacent one end and along one side thereof and operable for undergoing movement between a lower bale-engaging position and an upright bale-discharging position for depositing a bale onto said beams adjacent said one end of said frame;

(c) a bale pushing mechanism movably supported at said one end of the mobile frame and operable for undergoing reciprocal movement through working and return strokes to move each bale deposited onto said beams through a distance greater than an axial length of a bale thereby allowing transfer of a succeeding bale from said pickup to said beams of said frame and movement thereof until a row of bales has been accumulated on said beams of said frame; and

(d) a bale unloading mechanism pivotally mounted to said mobile frame and operable for undergoing movement between a lowered position underlying the row of bales on said frame and a tilted raise position for unloading the row of accumulated bales from said longitudinal beams of said frame so as to discharge the bales all at the same time therefrom, said bale unloading mechanism including an elongated lift gate pivotally mounted to said frame between said longitudinal beams thereof and disposed below the level of said upper surfaces of said longitudinal beams when in said lower position so as to avoid obstruction of movement of the bales along said longitudinal beams, said bale unloading mechanism also including a plurality of actuators connected between said lift gate and said frame and being operable for pivoting said lift gate between said lowered position underlying the row of bales on said frame and said tilted raised position.

5,062,758

SHUTTLE SYSTEM FOR RAPIDLY MANIPULATING A WORKPIECE INTO AND OUT OF AN ATMOSPHERICALLY CONTROLLED CHAMBER FOR DOING WORK THEREON IN THE CHAMBER

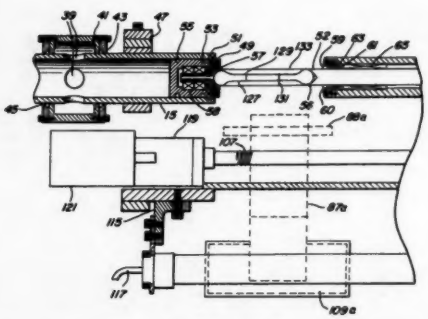
Richard E. Trillwood, Santa Ana, Calif., assignor to Wentgate Dynaweld, Inc., Agawam, Mass.

Continuation of Ser. No. 332,346, Mar. 31, 1989. This application Apr. 19, 1990, Ser. No. 511,332

The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.

Int. Cl.[5] B65G *65/30*

U.S. Cl. 414—217 34 Claims



1. Shuttle system for moving a workpiece into and out of a sealed chamber through a single aperture in the chamber wall, said chamber containing a controlled high vacuum atmosphere for doing work on the workpiece in the chamber, said system comprising:

a passageway extending into said sealed chamber through said single aperture at a first end and being open to the atmosphere at a second end; said passageway having at least one exhaust hole between said first end and said second end for reducing pressure in said passageway;

a split person having a headstock with a leading end and a trailing end physically connected to a tailstock with a leading and trailing end, with space between said headstock and tailstock for receiving a workpiece, said piston being sized to fit and move within said passageway;

means for moving said piston into and out of said chamber through said passageway in a reciprocal manner;

first sealing means on the headstock of said piston for sealing said headstock against an interior of said passageway at said first sealing means;

second sealing means on said headstock for sealing said headstock against an interior of said passageway at said second sealing means, spacing between said first and second sealing means being such that when said first sealing means is on a chamber side of said exhaust hole, said second sealing means is still engaging the interior of said passageway on the atmosphere side of said exhaust hole; and

a third sealing means for sealing the interior of said passageway to said piston at said third sealing means, spacing between said second and third sealing means being such that when said third sealing means begins sealing said tailstock with the interior of said passageway, said second sealing means is still on an atmosphere side of said exhaust hole;

whereby said exhaust hole in said passageway is not exposed to atmosphere during loading of the workpiece in said piston, passage of the workpiece into and out of said chamber, and during unloading of the workpiece from said piston.

5,062,759

SAFETY CIRCUIT ARRANGEMENT FOR LIFTING/TILTING OR TILTING DEVICES

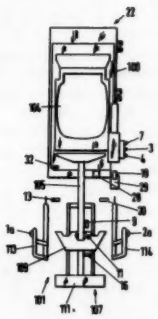
Hans J. Pieperhoff, Mainz Laubenheim, Fed. Rep. of Germany, assignor to Zöller-Kipper GmbH, Mainz-Laubenheim, Fed. Rep. of Germany

Filed Mar. 30, 1990, Ser. No. 503,442

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1989, 3910660

Int. Cl.[5] B65F *3/04*

U.S. Cl. 414—408 16 Claims



1. Safety circuit arrangement for a lifting/tilting device for emptying a container into a garbage truck (22), said circuit arrangement having an automatic control unit (30) for regulating an automatic emptying cycle of the container into a collection bin (100) of said truck (22), and said safety circuit arrangement having a first switch (16) and a second switch (11), which are mounted on said lifting/tilting device and which are each actuatable to intended predetermined statuses in response to a container being correctly placed and correctly positioned upon said lifting/tilting device, characterized in that said switches (16, 11) are connected to an electrical current flow monitor means (25) which continuously functions and which is electrically connected to said automatic control unit (30), and which monitor means continuously checks and continuously oversees the said intended predetermined statuses of the switches (16, 11) and transmits an operation-rendering signal to said automatic control unit (30) only during such times that the said switches (16, 11) are both disposed in said predetermined respective statuses corresponding to said correct positioning of the container on said lifting/tilting device.

5,062,760

MATERIAL HANDLING SYSTEM

Felix Samaniego, Roswell, assignor to Transport Technology Corporation, Roswell, N. Mex.

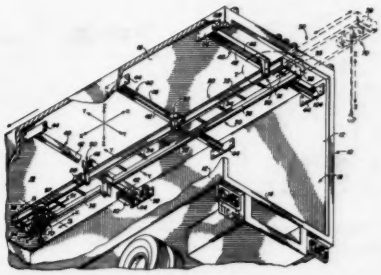
Filed Apr. 16, 1990, Ser. No. 510,133

Int. Cl.[5] B60P *1/54*

U.S. Cl. 414—542 7 Claims

1. A material handling system for moving cargo both within and without the cargo compartment of a vehicle, said cargo compartment having a bed and opposed sidewalls, a front end and rear opening thereto and having an X-axis traversing the length of the compartment, a Y-axis traversing the width of the compartment, and a Z-axis traversing the height of the compartment, said system including: at the least two spaced apart Y-axis frame means extending between the sides of said compartment and positioned at the upper portion of said compartment sidewalls, each of said Y-axis frame means including a channel extending substantially the length of said Y-axis frame means; an X-axis frame positioned beneath said Y-axis frame means and extending substantially the length of the x-axis of said compartment, said X-axis frame being suspended from and mounted to each of said Y-axis frame means by a carriage

assembly in a manner such that said X-axis frame will move through both the X-axis and Y-axis of said comparemtn both inside and outside said compartment; said carrige assembly provided with roller means mounted in the channel of said Y-axis frame means to allow said X-axis frame to move along the Y-axis of said compartment, said carriage assembly provided with additional roller means to support said X-axis frame and to allow said X-axis frame to move along said X-axis; hoist



means movably mounted on said X-axis frame; a first drive means for movign said X-axis frame and hoist means through the Y-axis of said compartment; second drive means for movign said hoist means along said X-axis frame, said second drive means also providing the means for moving said X-axis frame through the X-axis of said compartment to a predetermined distance outside of and back into said compartment; and means to control the operation of said first and second drive means.

5,062,761

TELESCOPIC MANIPULATION ARM

Charles Glachet, Vendome, France, assignor to Euritech, Vendome, France

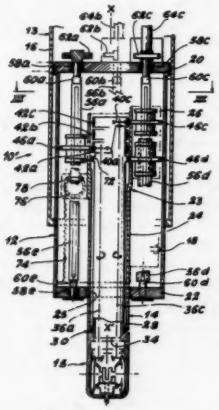
PCT No. PCT/FR88/00480, § 371 Date Mar. 12, 1990, § 102(e) Date Mar. 12, 1990, PCT Pub. No. WO89/02809, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 29, 1988, Ser. No. 490,602

Claims priority, application France, Sep. 30, 1987, 87 13517

Int. Cl.[5] B25J *3/00*

U.S. Cl. 414—729 **7 Claims**



1. A telescopic manipulation arm, which comprises:

an external tubular body and an internal tubular body arranged along a common axis and defining therebetween an annular space in which are mounted in parallel and equidistantly of said axis a plurality of first rotary shafts supported in a rotary manner by the external tubular body

a plurality of second rotary shafts supported in a rotary manner within the internal tubular body, the latter being supported in a rotary manner by an intermediate part so as to be slidable in the external tubular body along said common axis,

means for controlling translation of the intermediate part in the external tubular body, the intermediate part supporting in a rotary manner first identical pinions, each first pinion being traversed by one of the first shafts and being rotatable with the latter by a first transmission means;

drive means by which one of the first pinions is rotatable with the internal tubular body wherein each of the remaining first pinions is rotatable with said second rotary shafts;

the second rotary shafts all each mounted in parallel and equidistantly of said axis, said drive means incorporating second substantially identical pinions fixed to each of the second shafts, and substantially identical toothed gears centered on said common axis and supported in a rotary manner by the intermediate member, each of the toothed gears having an external tooth system engaged on one of the remaining first pinions and an internal tooth system engaged with one of the second pinions.

5,062,762

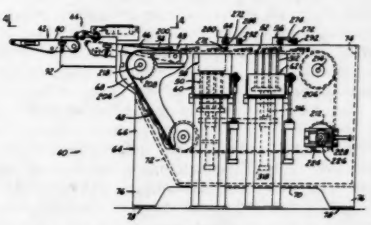
BATTERY PLATE STACKER METHOD

John W. Wirtz; David Yanik; Robert R. Rader; Roel Mendoza, and Dennis E. Essig, all of Port Huron, Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Division of Ser. No. 367,020, Jun. 16, 1989, Pat. No. 4,973,218, which is a continuation-in-part of Ser. No. 209,911, Jun. 22, 1988, abandoned. This application Mar. 2, 1990, Ser. No. 488,272

Int. Cl.[5] B65G *57/14*

U.S. Cl. 414—786 **25 Claims**



1. A method of stacking battery plates comprising, conveying a plurality of battery plates in sequence along a first predetermined path, synchronizing the plates being conveyed with a carrier for moving the plates into one of at least two downstream plate receiving stations, transferring plates to the carrier, supporting the plates on the carrier so they are retaining thereon only by frictional engagement therewith and so they can be disengaged therefrom if stopped to deposit them in a stack, removing plates which are not synchronized with the carrier, sequentially in one and then another of the plate receiving stations rapidly stopping each of a plurality of succeeding synchronized plates and disengaging each such synchronized plate from the carrier to deposit them in a stack on an elevator underlying said plate receiving stations, retracting the elevator as each plate is deposited so that the next plate to be stopped can be received on the stack, periodically switching the depositing of synchronized plates to the other station and ceasing depositing plates in said one station to provide a stack of the desired height in said one station, and periodically removing stacks of plates from the elevator associated with each station.

5,062,763

STACKER, ESPECIALLY FOR AN OFFSET PLATE TRANSPORTER

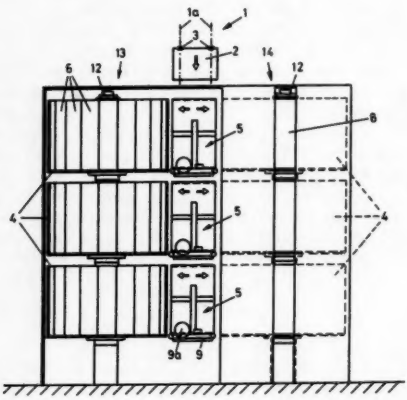
Willy Maier, Kloten, Switzerland, assignor to Daverio AG, Zurich, Switzerland

Filed Jun. 28, 1990, Ser. No. 545,275

Claims priority, application Switzerland, Aug. 9, 1989, 2930/89

Int. Cl.[5] B65G *1/133*

U.S. Cl. 414—787 **11 Claims**



1. A stacker suitable for use with an offset plate transporter, comprising:

a feed device for individually feeding plates to at least one storage unit, wherein the storage unit includes a rotatable storage drum having cells which are open along the circumference of the storage drum, and at least one drum loader for receiving the plates from the feed device and for inserting the plates into the cells of the storage drum;

wherein the drum loader has a stationary feed element for receiving a plate and for inserting the plate into an open cell of the storage unit, the feed device includes means for moving the plates vertically downwardly onto the feed element, the feed element includes a support for receiving a plate stopped and resting on the feed element, and the drum loader further includes means for transferring a plate from the feed device to the feed element, including means for moving the plate into position above the feed element so that the plate is stopped and removable from the feed device and comes to rest on the feed element.

5,062,764

METHOD AND APPARATUS USING ELECTROSTATIC CHARGES TO STABILIZE THE UPPER SHEETS OF A STACK OF PAPER

Bernhard J. Welsch, Waverly, Ohio, assignor to Robert A. Foisie, Carson City, Nev.

Filed Jan. 8, 1990, Ser. No. 462,140

Int. Cl.[5] B65H *3/18*; B65G *59/02*

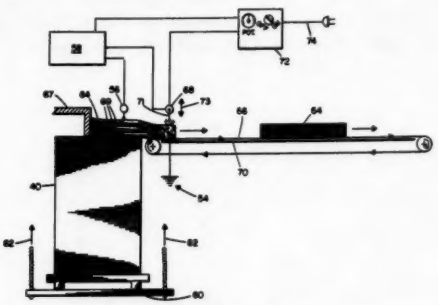
U.S. Cl. 414—796 **8 Claims**

5. An apparatus using electrostatic charges to temporarily hold sheets of paper in assembly comprising:

A. means for providing a skid load of sheets of paper with the sheets in at least a lower portion of said skid load being electrostatically charged so at least said lower portion sheets tend to repel one another;

B. means for separating a predetermined number of sheets from said skid load to form a separated stack of sheets;

C. means for introducing to said separated stack of sheets an electrostatic charge of opposite polarity to said existing electrostatic charge in the lower portion sheets, said electrostatic charge of opposite polarity acts in combination with the weight of said separated stack of sheets to cause said sheets in said separated stack to attract to one another thereby decreasing the tendency of said sheets to repel one another; and



D. means adjacent said skid load for conveying said separated stack for further processing.

5,062,765

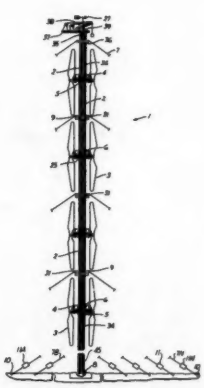
HIGH TOWER WIND GENERATING SYSTEM

H. Reginald McConachy, 2/9 David Street, Balaclava 3183, Victoria, Australia

Filed Jun. 25, 1990, Ser. No. 542,578

Int. Cl.[5] F03D *7/04*

U.S. Cl. 415—4.3 **4 Claims**



1. A wind generating system comprising in combination:

a vertically oriented tower having a series of interconnected modular mast sections along a vertical height connected by joints, said tower carrying a plurality of wind powered generators with accompanying rotors positioned at a multiplicity of vertical levels between the joints of said interconnected modular mast sections,

a guy wire system for supporting the tower against lateral forces at a multiplicity of vertical levels from positions on the tower between the rotors,

articulation means connected to define said joints between adjoining modular mast sections permitting the individual mast sections to be relatively angularly moved in response to lateral forces on the tower, and

further comprising a maintenance platform supported by the tower at a position above the wind generators with a rotatably positionable crane for use in servicing the wind generators.

4. A wind generating system comprising in combination:

a vertically oriented tower having a series of interconnected modular mast sections along a vertical height connected by joints, said tower carrying a plurality of wind powered generators with accompanying rotors positioned at a multiplicity of vertical levels between the joints of said interconnected modular mast sections,

a guy wire system for supporting the tower against lateral forces at a multiplicity of vertical levels from positions on the tower between the rotors,

articulation means connected to define said joints between adjoining modular mast sections permitting the individual mast sections to be relatively angularly moved in response to lateral forces on the tower,

wherein the tower comprises at the joints a network of bracing members arranged on four sides of a substantially square cross section configuration, and

wherein the articulation joint means comprise at each joint a hollow steel block with substantially the same square cross section as the tower interposed between adjacent mast sections, the adjacent mast sections terminate in two tapered universal joint yokes curved at the free ends on only two opposite sides of the mast sections, the respective yokes on adjacent mast sections being oriented perpendicular to each other, the articulation joint means has bearing surfaces with mating curved engagement surfaces for receiving the universal joint yokes merging into angularly tapered sides forming a sector shaped cage permitting an angular motion about a pivot axis in the yokes confined to a limited degree of angular movement.

5,062,766

TURBO COMPRESSOR

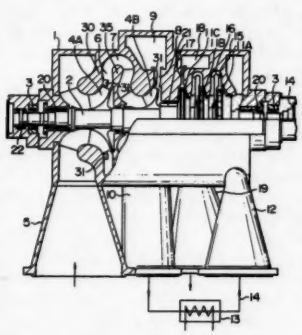
Haruo Miura, Ibaraki; Yasuo Fukushima, Tsuchiura; Hideo Nishida; Hiromi Kobayashi, both of Ibaraki, and Takeo Takagi, Tsukuba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1989, Ser. No. 406,299

Claims priority, application Japan, Sep. 14, 1988, 63-228726; Sep. 14, 1988, 63-228744

Int. Cl.[5] F01D *1/02*

U.S. Cl. 415—199.1 **14 Claims**



1. A turbo compressor having a plurality of impellers mounted on an impeller shaft so as to form a plurality of stages through which a gas is progressively compressed, comprising:

at least one open-type non-shrouded first impeller having a gas outlet angle such that gas discharged from the outlet of said first impeller flows in a direction which is in line from the radial direction towards the axial direction of said impeller shaft when viewed in a meridional plane; and

at least one second impeller having a gas outlet angle such that gas discharged from said second impeller flows in the radial direction of said impeller shaft, said first and second impellers being mounted on said impeller shaft such that inlet sides of said impellers are disposed adjacent to opposite ends of said impeller shaft with outlet sides of said impellers being disposed adjacent to a center of said impeller shaft.

5,062,767

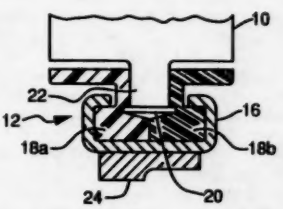
SEGMENTED COMPOSITE INNER SHROUDS

Kevin L. Worley, Palm Beach Gardens; John L. Mayers, Lake Park, and Herbert L. Burchette, West Palm Beach, all of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 27, 1990, Ser. No. 516,493

Int. Cl.[5] F01D *5/00*

U.S. Cl. 415—209.3 **2 Claims**



1. A shroud for supporting airfoils positioned within the hot gas flow path of a gas turbine engine, comprising:

a plurality of said airfoils; and

a metal ring having a C-shaped cross section and a positive coefficient of thermal expansion, said metal ring being formed of two half circles;

a lightweight ceramic ring comprised of a plurality of abutting and touching ceramic segments, said ceramic segments being movably contained within the C-shaped cross section of said metal ring, said each ceramic segment also being formed in two circumferential halves, said metal ring further enveloping said ceramic segments on more than three sides of the ceramic segment cross section, said segments having a coefficient of expansion substantially less than said coefficient of expansion of said metal ring, said airfoils being supported in said flow path from said ceramic segments, whereby expansion of said metal ring results in the separation of said abutting, previously touching ceramic segments and the apparent growth of said segments.

5,062,768

COOLED TURBOMACHINERY COMPONENTS

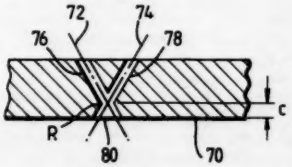
Peter V. Marriage, Derby, England, assignor to Rolls-Royce plc, London, England

Continuation of Ser. No. 450,068, Dec. 13, 1989, abandoned. This application Apr. 29, 1991, Ser. No. 693,014

Claims priority, application United Kingdom, Dec. 23, 1988, 8830152

Int. Cl.[5] F01D *5/18*

U.S. Cl. 416—97 R **13 Claims**



1. A film-cooled component having wall means comprising a first surface subject to heating by flow of hot fluid therepast and a second surface subjected to cooling by flow of pressurized coolant therepast, the first surface having a plurality of small coolant exit apertures therein connected to the second

surface by cooling hole structures extending through the wall means, whereby coolant exits from said apertures onto the first surface for film-cooling of the same, each cooling hole structure comprising in flow series a plurality of coolant entry apertures in said second surface, a flow constriction and one of said exit apertures connected only to said one flow constriction, each cooling hole structure being a plurality of substantially straight mutually intersecting holes which share said flow constriction and said exit aperture, each cooling hole structure being separated by a portion of said wall means from each other cooling hole structure so that said cooling hole structures are unconnected to one another, said flow constriction comprising the intersection of said holes and said exit aperture being formed adjacent said intersection, said flow constriction being of smaller flow are than said exit aperture.

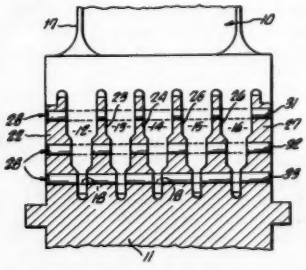
10. A method for producing a film-cooled component, the component having wall means comprising a first surface subject to heating by flow of hot fluid therepast and a second surface subject to cooling by flow of pressurized coolant therepast, the method comprising drilling a plurality of groups of film-cooling holes through the wall means to connect the first surface to the second surface, the members of each group of holes being drilled sequentially with different but crossing orientation with respect to each other such that they penetrate the first surface in overlapping fashion to form a common coolant exit aperture and intersect each other to form a flow constriction for controlling the flow rate of coolant out of the common exit aperture, said flow constriction being of smaller flow area than said exit aperture, and including the step of maintaining the members of each group having a common coolant exit aperture separated from the members of each other group associated with a different exit aperture.

5,062,769

CONNECTOR FOR TURBINE ELEMENT

Ralph J. Ortolano, 3776 Coolheights Dr., Rancho Palos Verdes, Calif. 90274

Filed Nov. 22, 1989, Ser. No. 440,239
Int. Cl.[5] F01D *5/32*
U.S. Cl. 416—217 22 Claims



1. A device for connecting a first turbine element with a second turbine element comprising a pin formed with a first metallic material, a surface of the pin being in a compression condition and a layer of a second metallic material on the surface of the pin, and wherein the first material is relatively harder than the second material, and the second material provides a lubricating outer surface to the pin.

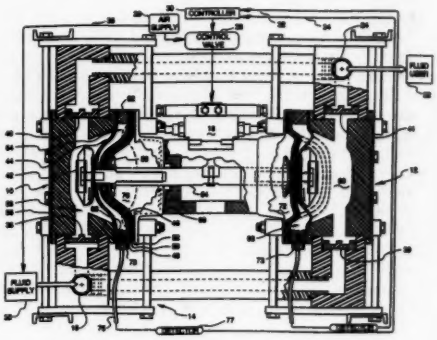
15. A method for connecting a turbine blade and a rotor including providing a formation on the blade and a formation on the rotor, interengaging the formation of the blade with the formation of the rotor, apertures being provided in the interengaging formations for mating alignment, inserting a plurality of pins through the apertures, the pins being formed of a first metallic material and having a surface in a compression condition, a layer of a second metallic material being on the surface of the pin, the second metallic material providing a lubricating surface thereby to facilitate removal of the pins from the apertures.

5,062,770

FLUID PUMPING APPARATUS AND SYSTEM WITH LEAK DETECTION AND CONTAINMENT

Carl E. Story, Cupertino; Jerry A. Nichols, San Jose, and Byron C. Cady, Gilroy, all of Calif., assignors to Systems Chemistry, Inc., Milpitas, Calif.

Filed Aug. 11, 1989, Ser. No. 393,142
Int. Cl.[5] F04B *43/06*
U.S. Cl. 417—46 18 Claims



1. A fluid pumping apparatus for pumping ultra pure fluids and including means for detection and prevention of contamination of the fluids in the event of diaphragm failure, comprising:

means forming a pump housing having an inlet and an outlet;

a first pumping component formed within said housing and adapted to draw fluid into said inlet and to force fluid out of said outlet, said first pumping component including a first diaphragm means combining with said housing to form a first pumping chamber in communication with said inlet and said outlet, first generally annular spacer means having a first opening formed therein extending radially through one side thereof, and a second diaphragm means held in spaced apart relationship with said first diaphragm means by said spacer means and combining with said first diaphragm means and said spacer means to form a first containment chamber, said first and second diaphragm means and all interior surfaces forming said first pumping chamber and said first containment chamber being made of inert material;

first sensor means extending into said opening and having a distal end surface disposed within said first opening and forming a closure for said first containment chamber, said first sensor means being operative to detect the presence of unintended fluid appearing in said first containment chamber as a consequence of the failure of said first diaphragm means and to generate a commensurate first output signal for transmission to a remote indicator; and

first actuator means for reciprocatingly moving said first diaphragm means to cause fluid to be pumped through said first pumping chamber;

the said pumping apparatus being characterized in that any failure of said first diaphragm means allowing pumped fluid to invade said first containment chamber will result in complete containment and no contamination of the invading fluid, immediate detection of the failure by said first sensor means, and annunciation of the failure by said first output signal.

5,062,771

VACUUM SYSTEM WITH A SECONDARY GAS ALSO CONNECTED TO THE ROUGHING PUMP FOR A SEMICONDUCTOR PROCESSING CHAMBER

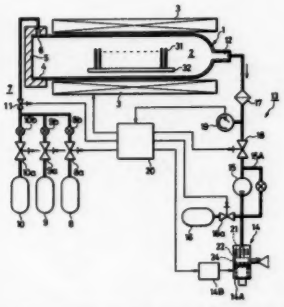
Akihiko Satou, Maebashi; Tadao Kusaka, Takasaki; Shigeo Tomiyama, Fujioka; Kouzi Aoki, Maebashi; Ichiro Gyobu, Dejima; Kimio Muramatsu; Hiroaki Sakamoto, both of Takasaki; Shinjiroo Ueda, Abiko; Masahiro Mase, Nogi, and Takashi Nagaoka, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Tokyo Electronics Co. Ltd., both of Tokyo, Japan

Division of Ser. No. 16,567, Feb. 19, 1987, Pat. No. 4,835,114. This application Mar. 20, 1989, Ser. No. 325,910

Claims priority, application Japan, Feb. 19, 1986, 61-32969; Feb. 19, 1986, 61-32970; Feb. 19, 1986, 61-32971; Apr. 23, 1986, 61-92197; Sep. 26, 1986, 61-226023

Int. Cl.[5] F04D *17/12, 25/00*

U.S. Cl. 417—201 52 Claims



1. A processing apparatus for gas phase treatment for semiconductor device fabrication comprising:

(a) a processing chamber for accommodating a semiconductor device;

(b) a gas supplying device for supplying a processing gas to the processing chamber;

(c) a main evacuation pump system for evacuating the processing chamber within a steady state during the treatment having only one set of one or more vacuum pumps, the one or more pumps being oil-free mechanical pumps which operate without using oil as an operating medium for gas evacuation and which include at least one roughing pump adapted to operate under atmospheric pressure; and

(d) a supply source for a gas having higher molecular weight than that of helium adapted is also connected to a suction port side of the roughing pump.

5,062,772

SLANT PLATE TYPE COMPRESSOR

Shigemi Shimizu, Sakai, and Kazuhiko Takai, Isesaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

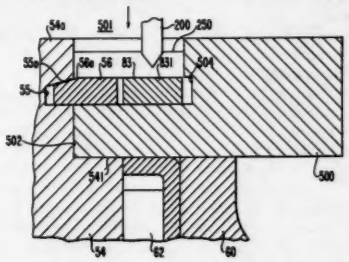
Filed Oct. 20, 1989, Ser. No. 424,691

Claims priority, application Japan, Oct. 25, 1988, 63-138134[U]; Oct. 25, 1988, 63-138136[U]

Int. Cl.[5] F04B *1/14*

U.S. Cl. 417—269 28 Claims

1. In a slant plate type refrigerant compressor comprising a compressor housing including a cylinder block, said cylinder block including a plurality of peripherally disposed cylinders, a crank chamber enclosed within said cylinder block at a location forward of said cylinders, said compressor housing including a suction chamber and a discharge chamber formed therein, a piston slidably fitted within each of said cylinders, a drive mechanism coupled to said pistons to reciprocate said pistons within said cylinders, said drive mechanism including a drive shaft rotatably supported in said housing, said drive mechanism further including coupling means for coupling said drive shaft to said pistons such that rotary motion of said drive shaft is converted into reciprocating motion of said pistons in said cylinders, said coupling means including a slant plate disposed on said drive shaft and having a surface disposed at an inclined angle relative to said drive shaft, said slant plate having a boss, an annular balance weight disposed about said boss, said annular balance weight including a thin plate region defining a recessed portion, and a retaining means including a first annular groove formed on said boss and a first annular member



disposed in both said groove and said recessed portion, said first annular member in contact with said recessed portion of said balance weight to retain said balance weight on said boss of said slant plate, the improvement comprising:

said retaining means further comprising a second annular member securely disposed in said recessed portion peripherally around said first annular member, said second annular member acting to securely retain said first annular member in said groove to securely retain said balance weight on said boss.

5,062,773

SWASH PLATE TYPE REFRIGERANT COMPRESSOR WITH A SEPARATOR OF REFRIGERANT GAS AND LUBRICANT OIL

Katsunori Kawai; Hayato Ikeda; Naoya Yokomachi, and Toshihiro Kawai, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokku Seisakusho, Aichi, Japan

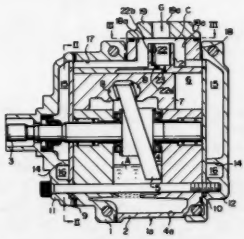
PCT No. PCT/JP90/00274, § 371 Date Oct. 25, 1990, § 102(e) Date Oct. 25, 1990, PCT Pub. No. WO90/10156, PCT Pub. Date Sep. 7, 1990

PCT Filed Mar. 2, 1990, Ser. No. 601,732

Claims priority, application Japan, Mar. 2, 1989, 1-50490

Int. Cl.[5] F04B *39/04, 27/08;* F01M *1/00*

U.S. Cl. 417—269 4 Claims



1. A swash plate type refrigerant compressor provided with a separating means for conducting a separation of lubricant oil from a refrigerant gas, comprising:

a cylinder block assembly provided with a plurality of cylinder bores arranged around a fixed axis, and a swash plate chamber;

a drive shaft rotatably supported by said cylinder block assembly, and having an axis of rotation coinciding with said fixed axis;

a swash plate mounted on said drive shaft to be rotated therewith, and wobbled in said swash plate chamber;

a plurality of double-headed pistons arranged to be reciprocated in said cylinder bores of said cylinder block assembly in response to a rotation of said drive shaft and said swash plate, to thereby perform a suction, compression, and discharge of the refrigerant gas;

suction passageway means provided in said cylinder block assembly for permitting a refrigerant gas in which a lubricant oil is suspended and contained to flow toward said cylinder bores when sucked from an external refrigerating circuit;

cylindrical chamber means for a separation of the lubricant oil from the refrigerant gas, arranged in a part of said suction passageway means, and provided with an opening directed toward an entering direction of a flow of said refrigerant gas from said external refrigerating circuit into said cylinder block assembly, and having an internal spacing having an appreciable volume defined therein; and

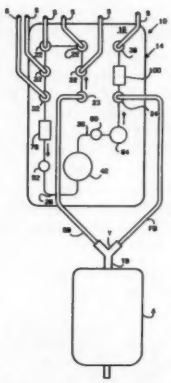
a communicating through-hole formed in a bottom wall of said cylindrical chamber means for fluidly communicating between said internal spacing of said chamber means and said swash plate chamber, to thereby permit said lubricant oil to flow from said cylindrical chamber means into said swash plate chamber.

5,062,774

SOLUTION PUMPING SYSTEM INCLUDING DISPOSABLE PUMP CASSETTE

David E. Kramer, Northbrook; Andrew J. Muetterties, Mundelein, and Walter T. Szempruch, Gurnee, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 1, 1989, Ser. No. 444,459
Int. Cl.[5] F04B *43/04*
U.S. Cl. 417—413 **22 Claims**



1. A pump cassette for use with an associated pump driver having a reciprocable pump plunger and a plurality of valve actuators, said pump cassette comprising:

a cassette body including a plate-like front body member, and a juxtaposed, plate-like rear body member; and

elastomeric diaphragm means positioned between said front and rear body members, said cassette body and said diaphragm means together providing said pump cassette with a plurality of liquid inlets including at least one downstream inlet at least one liquid outlet, a liquid flow path for joining said liquid inlets and outlet in fluid communication, and pump means operably driven by the pump plunger of said associated pump driver for pumping liquid from a selected one of said liquid inlets to said liquid outlet via said flow path,

said front and rear body members being joined to each other at marginal joint means extending along at least a portion of confronting marginal edges of said front and rear body members,

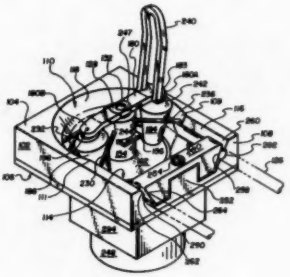
said front and rear body members being further joined together inwardly of said marginal joint means at diaphragm joint means, said diaphragm joint means extending completely about the periphery of said diaphragm means for enhancing sealing of said liquid flow path.

5,062,775

ROLLER PUMP IN AN EXTRA CORPOREAL SUPPORT SYSTEM

Jeffrey L. Orth, Salt Lake City, Utah, assignor to Rocky Mountain Research, Inc., Salt Lake City, Utah

Filed Sep. 29, 1989, Ser. No. 414,780
Int. Cl.[5] F04B *43/12*
U.S. Cl. 417—477 **12 Claims**



1. A roller pump comprising:

a housing having a top and a bottom;

a recess formed in said housing with a surface extending inwardly from the top of said housing;

axle means adapted to said housing in said recess to rotate relative to said housing;

arm means secured to axle means to rotate therewith, said arm means including locking means for removably securing said arm means to said axle means and said axle means including an engagement portion for engaging said arm means, and further including a handle means having a first position extending away from said arm means and a second position in which said handle means is positioned proximate said arm means;

roller means secured to said arm means and positioned proximate said surface for movement therealong upon rotation of said axle means;

adjustment means interpositioned between said axle means and said arm means for moving the arm means and in turn said roller means; and

a latch member movable between a first position in which the latch member engages the engagement portion to secure said arm means to said axle means and a second position in which the latch member is disengaged from the said engagement portion for removal of said roller means from said recess.

5,062,776

COMMUTATOR FOR ORBITING GEROTOR-TYPE PUMPS AND MOTORS

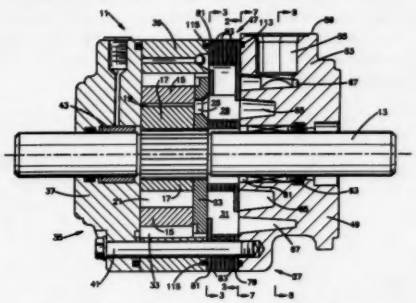
Andrew N. Dlugokecki, Bridgton, Me., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Aug. 4, 1989, Ser. No. 389,657
Int. Cl.[5] F03C *2/08*; F04C *2/10*
U.S. Cl. 418—61.3 **12 Claims**

1. An improved hydraulic pump or motor of the type having a commutator with an inlet port and outlet port therein connected, respectively, to a plurality of alternating inlet and outlet commutator openings formed in the commutator and

disposed in a circular array adjacent to a rotating valve plate disposed between said commutator and a rotating set of gerotor-type gears and which selectively communicates said inlet and outlet commutator openings with a said rotating set of gerotor-type gears, the improvement comprising:

said commutator comprising a chamber section which includes said inlet and said outlet extending radially outwardly therein; said chamber section having a face with a planar portion having hollow concentric chambers formed therein including a radially inner and a radially



outer annular chamber each of which is connected to a selected one of said inlet and outlet; and

said commutator also comprising a pathways section disposed adjacent and in sealing relation with said face of said chamber section and having said plurality of inlet and outlet commutator openings therein; said pathways section having fluid pathways therein which connect said inlet commutator openings to said annular chamber of said chamber section which is connected to said inlet port, and which connect said outlet commutator openings to said annular chamber which is connected to said outlet port.

5,062,777

PUMP SEAL ARRANGEMENT ACCESSIBLE FROM THE BASE PLATE

Ulf Carlsson, Kristinehamn, Sweden, assignor to Johnson Pump AB, Orebro, Sweden

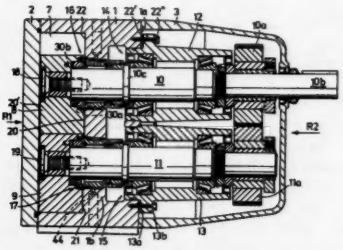
PCT No. PCT/SE89/00110, § 371 Date Oct. 12, 1989, § 102(e) Date Oct. 12, 1989, PCT Pub. No. WO89/08782, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 8, 1989, Ser. No. 424,203

Claims priority, application Sweden, Mar. 17, 1988, 880096

Int. Cl.[5] F04C *27/00*

U.S. Cl. 418—104 **11 Claims**



1. A pump assembly comprising:

a pump housing which constitutes the pump's foundation for mounting said pump assembly on a support means;

said housing defining a working space therein for product-feeding units and having a front and rear portion, front and rear recesses provided in said front and rear portion of said pump housing and a front gable having at least a gable section removably fitted to said front portion of said pump housing;

a casing connected to said rear portion of said pump housing for enclosing parts of bearing axles of said units projecting from said housing, which are adapted to be fitted through said rear recesses prior to connection of said casing to said pump housing and for extending through said working space and into said front recesses, said axles being connected in a rotationally fixed manner to said units;

movement-transmitting elements for the axles supported in the pump housing;

sliding ring seals arrangements provided at said front recesses for sealing off said working space from rear parts of said pump, said sliding ring seals arrangements being accessible from said front portion of said housing through said removable gable section, sliding ring seals of each arragnement including a rotationally fixed part and at least one rotatable part;

a seat member provided at each of said front recesses of said pump housing for supporting said rotationally fixed portion of said sliding ring seal and adapted for interacting with an element for fixing axial displacement of said rotationally fixed part;

each of said sliding ring seals arrangements also including an exposed rear surface which is accessible to an extraction tool for extraction of said sliding ring seals arrangement, said extraction element being insertable over a respective axle from the front portion of said pump upon removal of said removable gable section and respective product-feeding unit;

an abutting surface provided in said pump housing for interacting with respective bearing sleeve for adjustment of the position of said axle and corresponding unit in a direction of longitudinal displacement with respect to said seat for providing a gap of predetermined width between an inner limiting wall in said working space and a rear surface of said each unit and a gap between an inner surface of said front gable and end surfaces of said units.

5,062,778

HELICAL BLADE TYPE COMPRESSOR WITH THRUST LOSS COMPENSATION

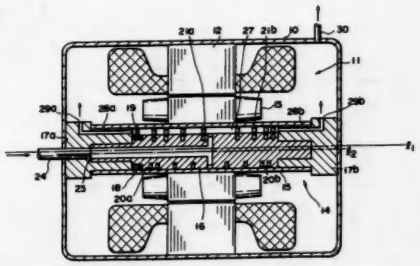
Hitoshi Hattori, Yokohama; Hirotsugu Sakata, Chigasaki; Makoto Hayano, Tokyo; Masayuki Okuda, Kawasaki, and Naoya Morozumi, Machida, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 388,634, Aug. 2, 1989, abandoned. This application Feb. 21, 1991, Ser. No. 657,958

Claims priority, application Japan, Oct. 31, 1988, 63-275574

Int. Cl.[5] F04C *15/00*

U.S. Cl. 418—220 **16 Claims**



1. A helical blade type compressor comprising:

a cylinder;

a piston eccentrically arranged in said cylinder along an axial direction thereof so as to be rotated relative to said cylinder while a part of said piston is in contact with an inner surface of said cylinder, said piston having first and sec-

ond helical grooves formed in an outer surface thereof and separated at a central portion thereof, pitches of said first and second helical grooves being gradually increased from both end portions to the central portion of said piston;

first and second blades, respectively inserted in said first and second helical grooves of said piston so as to be moved in and out of said grooves and having outer edges helically brought into contact with said inner surface of said cylinder, for partitioning a space between the inner surface of the cylinder and the outer surface of said piston into a plurality of operation chambers, volumes of the plurality of operation chambers corresponding to the gradual pitch increase;

fluid introducing means having a hollow portion formed in said piston along the axial direction thereof and between at least one end portion of the piston and a central portion of the piston, for introducing a fluid to be compressed into a large-volume operation chamber of the plurality of operation chambers, which corresponds to the central portion of said piston;

driving means for causing the fluid introduced into the large-volume operation chamber to branch into the operation chambers constituting two channels whose volumes are gradually decreased toward both the end portions of said piston and sequentially supplying the fluid by rotating said piston relative to said cylinder, said driving means including a motor section for rotating said cylinder, transmitting means for transmitting a rotational force of said cylinder to said piston and first and second bearings for rotatably supporting both end portions of said cylinder and both end portions of said piston;

fluid extracting means for extracting a compressed fluid obtained by causing the fluid to branch into the operation chambers of the two channels and sequentially supplying the fluid; and

a sealed case for housing at least said cylinder, said driving means and said fluid extracting means, and for storing a compressed fluid which is extracted by said extracting means therein;

wherein said motor section includes a stator fixed in said sealed case and a rotor arranged inward from said stator, said rotor being fixed to an intermediate portion of said cylinder.

5,062,779

OUTLET VALVE FOR A ROLLING PISTON ROTARY COMPRESSOR

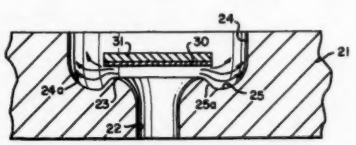
Caio M. F. N. Da Costa, Joinville, Brazil, assignor to Empressa Brasileira De Compressores S.A.-Embraco, Joinville, Brazil

Filed Feb. 27, 1990, Ser. No. 486,980

Claims priority, application Brazil, Mar. 9, 1989, PI 8901183

Int. Cl.[5] F04C *18/344;* **F16K** *15/16*

U.S. Cl. 418—270 **9 Claims**



1. An outlet valve for a rotary rolling piston compressor, comprising:

a cylinder of metal formed by a cylinder block and two opposed end walls,

A piston moving within said cylinder and defining a suction chamber and a compression chamber,

the outer face of one of the end walls having an oblong recess formed therein, said one end wall also having a gas discharge passage extending therethrough in the area of said oblong recess communicating with one of said chambers,

an annular valve seat at the outlet end of said gas passage extending upwardly from the bottom wall of the recess, the upper end of said seat being below the outer face of said one end wall,

a blade outlet valve located in said oblong recess for sealing the gas passage outlet by resting on said seat,

said seat having a continuous rounded surface starting from its interior at point before contact by the blade valve and on which the blade valve rests, and the junction of the recess bottom wall and the recess side wall circumscribing the valve seat having a concave curvature, the shape of the seat and junction serving to guide the gas around the junction and along the recess side wall.

5,062,780

VULCANIZATION APPARATUS

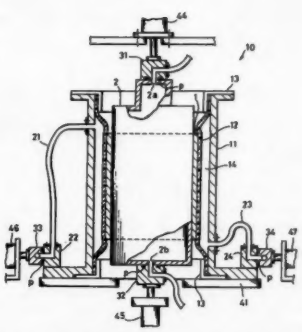
Toshio Nakagaki, Kobe, Japan, assignor to Bando Kabushiki Kaisha d/b/a Bando Chemical Industries, Ltd., Kobe, Japan

Filed Oct. 4, 1990, Ser. No. 592,844

Claims priority, application Japan, Oct. 31, 1989, 1-285482

Int. Cl.[5] B29C *43/12, 33/02, 33/34, 35/02*

U.S. Cl. 425—39 **2 Claims**



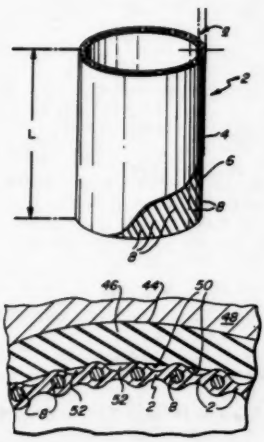
1. A vulcanization apparatus for vulcanizing a cylindrical rubber molding utilizing a heated fluid under pressure, comprising a cylindrical mold having a hollow interior, said mold being adapted to receive said molding over the external circumference thereof; a jacket comprising a tubular rubber sleeve mounted inside a cylindrical casing, both axial ends of said sleeve being secured and sealed to said casing, said jacket being dimensioned such that a molding and a mold can be inserted into said sleeve, an internal space between said casing and said sleeve being formed which when pressurized causes said sleeve to be swelled inwardly and the molding to be pressed by the inner circumference of said sleeve; first piping connected to said jacket to pass said fluid through said internal space; second piping connected to said mold to pass said fluid through said hollow interior, means for moving said jacket and said mold between a preparation position and a vulcanization position, and means for connecting said fluid to said jacket and to said mold when in said vulcanization position and disconnecting said fluid when in said preparation position.

5,062,781

REINFORCED TIRE CURING BLADDER

Walter Szyms, Trumbull, and Joseph W. Valaitis, Guilford, both of Conn., assignors to Firelli Armstrong Tire Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 230,735, Aug. 10, 1988, Pat. No. 4,877,469. This application Aug. 7, 1989, Ser. No. 390,627
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.
Int. Cl.[5] B29C *35/00*
U.S. Cl. 425—52 11 Claims



1. A tire processing bladder comprising a hollow, tubular relatively thin member having a tubular circumference extending around a tubular axis, said tubular membrane member inflatable to provide a circular circumference greater than the tubular circumference, said tubular membrane member having included therein a plurality of parallel cords, each said cord traversing a spiral path from one end to an opposing end of said tubular membrane at an angle of inclination with respect to the tubular axis, the relative thinness of said tubular membrane member permitting said cords to protrude from said tubular membrane member when formed to have said circular circumference to create reciprocal shallow areas between said cord lengths and thus form a matrix for venting air trapped between said tubular membrane member and an uncured tire, the inclination angle of said cords limiting the circular circumference by limiting the amount said tubular membrane member may be inflated, said tubular membrane member rotating substantially in a screw manner upon inflation into relatively close engagement with an inside surface of said uncured tire.

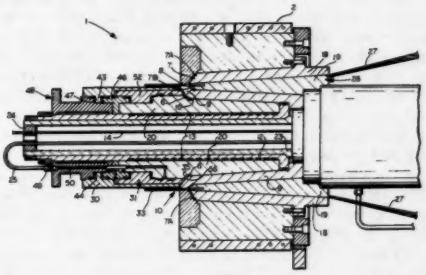
5,062,782

COEXTRUSION APPARATUS FOR VARYING THE INNER AND/OR OUTER PROFILE OF A TUBULAR EXTRUDATE

Dale A. Tompkins, Akron, and Richard W. Sicka, Brecksville, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jul. 24, 1990, Ser. No. 557,191
Int. Cl.[5] B29C *47/02, 47/06, 47/16*
U.S. Cl. 425—113 11 Claims

1. Coextrusion apparatus for varying the inner profile of a generally tubular extrudate, including an outer die assembly forming an outer extrusion orifice for forming the tubular extrudate, and an inner die assembly forming an adjustable inner extrusion orifice for depositing elastomeric material on an inner surface of the tubular extrudate for varying the inner profile of said extrudate; first means for forming an outer flow channel for delivering a first stream of an elastomeric material to the outer extrusion orifice of the outer die assembly to form the tubular extrudate; second means for forming an inner flow channel for delivering a second stream of an elastomeric material to the inner extrusion orifice of the inner die assembly; said inner die assembly having an axially movable annular compensating ring located concentrically within an axially movable annular die ring both of which extend in a downstream direction from the inner extrusion orifice; annular pistons cooperating with each of the die ring and compensating ring and spaced axially from each other downstream of the inner extrusion



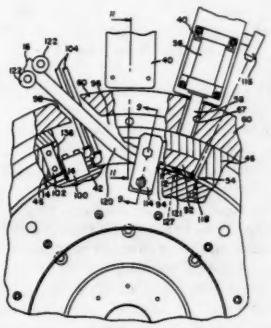
orifice, each of said pistons being axially movable within an annular fluid chamber; and fluid supply means communicating with each of the fluid chambers for reciprocally moving said pistons independently of each other for moving the die ring to vary the size of the inner extrusion orifice and for moving the compensating ring to vary the size of an expansion chamber in relationship to the size of the inner extrusion orifice, for controlling the pressure within the second stream of elastomeric material as it moves through said inner extrusion orifice for depositing on the inner surface of the tubular extrudate.

5,062,783

APPARATUS FOR INJECTION MOLDING TIRE TREADS

Norbert Majerus, and John S. Rambacher, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 295,988, Jan. 12, 1989, abandoned, which is a division of Ser. No. 202,130, Jun. 2, 1988, Pat. No. 4,826,416. This application Apr. 18, 1990, Ser. No. 512,534
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[5] B29C *45/14*
U.S. Cl. 425—115 3 Claims



1. Apparatus for injection molding of a continuous elongated body made of curable fluid molding material by increments said apparatus comprising a generally cylindrical segmental

mold having a core and radially expandable and contractible mold segments at circumferentially paced positions around said core forming a mold cavity in said mold, a closed end of said mold cavity at a trailing end of a first one of said segments, an open end of said mold cavity adjacent a leading end of said first one of said segments spaced from said closed end a distance less than the length of said elongated body, said core having a textured surface at said open end of said mold cavity, means for injecting a curable fluid molding material into said mold cavity to form a first section of said elongated body in a first position with a trailing portion abutting said closed end, means for heating said injected fluid molding material to cure said first section, temperatur moderating means for limiting the heating of said trailing portion of said first section at said closed end of said first one of said segments to prevent full curing of said trailing portion of said first section, means for expanding said segments of said mold to permit shifting of said first section circumferentially from said first position in said mold cavity to a second position with said trailing portion of said first section at said open end of said mold cavity and the remainder of said first section being outside of said mold, means to support said cured elongated body as it is shifted circumferentially in said mold cavity after expansion of said segments, means for closing asid mold to move said segments radially inward to enclose said mold cavity and urge said second oen of said segments radially inward to clamp said trailing portion of said first section against said textured surface, said means for injecting said curable fluid molding material being operative to form a second sectino of said elongated body with a leading portion of said second section abutting said trailing portion of said first section, and a trailing portion of said second section abutting said closed end of said mold cavity at said end of said first one of said segments, said means for heating being operative to heat said injected fluid molding material of said second section and said trailing portion of said first section to cure said second section and adhere said trailing portion of said first section to said leading portion fo said second section, and said means for expanding said mold segments being operative to expand said mold segments radially outward to open said mold and permit movement of said trailing portion of said first section and said second section of said elongated body circumferentially through said mold cavity.

5,062,784

MOLDING CONDITION RECORDING APPARATUS FOR AN INJECTION MOLDING MACHINE

Yoshiharu Inaba, Kawasaki; Hideo Naito, Hino; Masao Kamiguchi; Noriaki Neko, both of Yamanashi, and Shinsuke Sakakibara, Komae, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP89/00326, § 371 Date Oct. 25, 1989, § 102(e) Date Oct. 25, 1989, PCT Pub. No. WO89/09126, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 28, 1989, Ser. No. 432,744

Claims priority, application Japan, Mar. 28, 1988, 63-71904

Int. Cl.[5] B29C *45/77*

U.S. Cl. 425—143 **5 Claims**

1. A molding condition recording apparatus for an injection molding machine comprising:

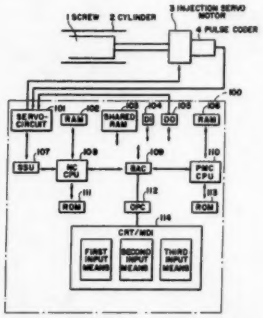
first input means for changeably inputting parameters which constitute one set of molding conditions, the one set of molding conditions consisting of plural groups of parameters;

first memory means for changeably storing the parameters constituting the one set of molding conditions;

second memory means for storing a plurality of stored sets of molding conditions including one or more stored sets of molding conditions that cause defective molding, the plurality of stored sets of molding conditions stored in said second memory means representing a history of processes for determining optimum molding conditions;

second input means for inputting a command to transfer the one set of molding conditions stored in said first memory means to said second memory means as one of the plurality of stored sets of molding conditions; and

control means for controlling said first and second memory



means so that the one set of molding conditions is stored in said second memory means as the one of the plurality of stored sets of molding conditions in response to an operation of said first and second input means.

5,062,785

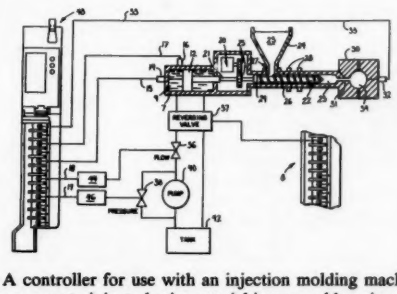
INJECTION MOLDING CONTROLLER WITH PROCESS VARIABLE LEARNING

James W. Stroud, III, Cleveland, and John F. Dodds, Newbury, both of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 15, 1990, Ser. No. 538,970

Int. Cl.[5] B29C *45/77*

U.S. Cl. 425—145 **4 Claims**



1. A controller for use with an injection molding machine having a ram to inject plastic material into a mold cavity during at least one stage of an injection molding cycle, the injection molding machine having a valve for receiving a control signal and controlling the ram, and a transducer for producing a process signal related to a response of the ram to the control signal, the controller comprising:

a memory for storing profile data for the at least one stage, the profile data being comprised of a plurality of segments of data each segment having a start and end delineated by startpoint data and each segment associated with a velocity setpoint;

a segment pointer for addressing the memory and identifying a current segment and the segment's current setpoint and for producing a transition signal at the end of a segment;

an open-loop control means for receiving the current setpoint determined by the segment pointer and converting the current setpoint to a first control signal for controlling the valve during a first period during the current segment;

a closed-loop control means for receiving the process signal from the injection molding machine and the current setpoint determined by the segment pointer to produce a

second control signal for controlling the valve during a second period during the current segment and after the first period; and

a setpoint correcting means responsive to the transition signal to compare the process signal at the end of the segment to the current setpoint in the memory to reduce a difference between the process signal and the current setpoint by changing the current setpoint in memory.

5,062,786

MOLDING DEVICE FOR MOLDING OPTICAL ELEMENTS

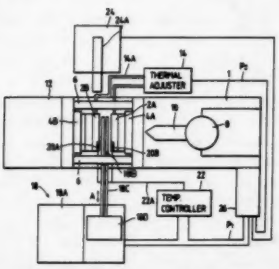
Takashi Arai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 448,544

Claims priority, application Japan, Dec. 12, 1988, 63-314512; Dec. 16, 1988, 63-317698; Jul. 4, 1989, 1-171219; Jul. 7, 1989, 1-174120; Jul. 10, 1989, 1-175579

Int. Cl.[5] B29C *45/73*

U.S. Cl. 425—174 **4 Claims**



1. A molding apparatus having a cavity formed by a movable side mold, said molding apparatus being provided with a circulating pathway for circulating a cooling medium;

an injection cylinder for injecting a resin into said cavity;

a mold driving means for opening and closing said molding apparatus;

a high frequency heating means having a coil member for heating said molding apparatus, an oscillation control section for heating said coil member and a progressing and retreating means for heating said cavity when said molding apparatus is open;

a mold temperature detecting means including, a temperature sensor for measuring the temperature of said molding apparatus;

a mold temperature control means including said cooling medium flowing through said circulating pathway provided within said molding apparatus;

a means for stopping oscillation of said coil member when said molding apparatus reaches a predetermined temperature peak; and a cooling medium temperature control means for of maintaining a constant temperature in said molding apparatus after said molding apparatus is closed.

5,062,787

ROTARY TYPE INJECTION ORIENTATION BLOW MOLDING MACHINE

Setsuyuki Takeuchi, Toguramachi, Japan, assignor to A.K. Technical Laboratory, Inc., Japan

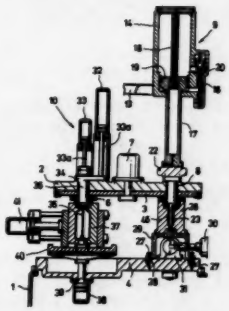
Filed Oct. 30, 1990, Ser. No. 605,989

Claims priority, application Japan, Oct. 30, 1989, 1-282807

Int. Cl.[5] B29C *49/06*

U.S. Cl. 425—522 **3 Claims**

1. A rotary injection orientation blow molding machine comprising a machine bed, a horizontal base plate vertically movably supported above said machine bed, tie bars on said machine bed, the base plate having portions of a peripheral edge thereof which are installed on said tie bars which are standing upright on said machine bed, said base plate having an underside spaced below said machine bed, a transfer plate rotatably mounted on said underside of said base plate, said transfer plate having a lower surface and having hold molds at three locations of said lower surface thereof, said base plate having an upper portion, a drive device located in a central portion of said upper portion of said base plate to intermittently rotate said transfer plate by a predetermined angle to bring each said hold mold to a said location of said transfer plate, a vertical clamping device and an injection mold with stop positions of said hold molds serving as an injection molding portion, an orientation blow molding portion and a releasing portion, respectively, a blow mold and orientation blow device, and a releasing device provided at predetermined locations above said machine bed, said tie bars having upper ends, a frame for connecting said upper ends of said tie bars with



each other, and a fixed plate downwardly having a clamping cylinder of said clamping device, said clamping cylinder being integrally molded to said fixed plate, said fixed plate being secured to said tie bars on both sides of said injection molding portion, a plurality of base plate vertically moving cylinders provided over said machine bed and at the peripheral edge of the base plate, said clamping device comprising a clamping cylinder including an upper and lower chamber wherein the inner diameter of said upper chamber is larger than the inner diameter of said lower chamber and both said chambers are communicated by a bypass provided with a closing valve, a cylindrical clamping ram extended through a central portion of said clamping cylinder, and said cylindrical clamping ram having a piston of an outer diameter matched to the diameter of said lower chamber and having a booster ram inserted therein.

5,062,788

HIGH EFFICIENCY LINEAR GAS BURNER ASSEMBLY

Willie H. Best, Columbia, S.C., assignor to Haden-Schweitzer Corporation, Madison Heights, Mich.

Continuation of Ser. No. 295,264, Jan. 10, 1989, abandoned. This application Jan. 24, 1991, Ser. No. 647,173

Int. Cl.[5] F23D *14/12*

U.S. Cl. 431—7 **29 Claims**

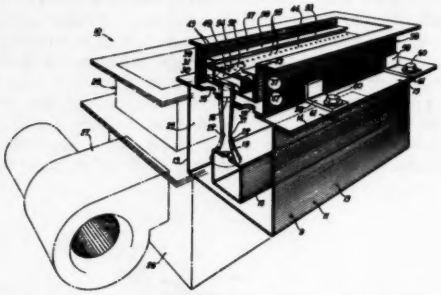
22. Process of burning fuel to produce heat, comprising:

(a) disposing a first plate and a second plate adjacent to each other to define therebetween a first chamber, said first plate and said second plate each defining spaced apertures therethrough, said apertures of said first plate being misaligned with said apertures of said second plate and having diameters, the distance between said first plate and said second plate being less than one-fourth of the diameter of one of said apertures of said second plate;

(b) passing a combustible fuel through the apertures of said first plate and into said first chamber under sufficient pressure that said fuel moves at a first velocity laterally in said chamber away from said apertures of said first plate and toward and through said apertures of said second

plate for emerging at a second velocity from said apertures of said second plate;

(c) controlling said first velocity of said fuel in said chamber around said perimeters of said apertures of said second plate so that said first velocity of said fuel around said



perimeters of said apertures of said second plate is greater than said second velocity of said fuel emerging from said apertures of said second plate; and

(d) igniting said fuel emerging from said apertures of said second plate.

5,062,789

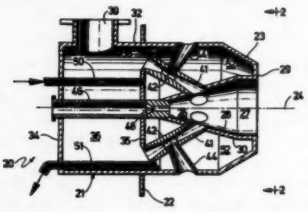
ASPIRATING COMBUSTION SYSTEM

Gregory M. Gitman, 3642 Frederica Rd., Duluth, Ga. 30106

Continuation of Ser. No. 203,803, Jun. 8, 1988, abandoned. This application Aug. 27, 1990, Ser. No. 574,500

Int. Cl.[5] F23D *21/00*

U.S. Cl. 431—9 **16 Claims**



1. A method of firing a furnace with an ongoing hydrocarbon flame formed in a combustion chamber of a burner and emitted from the combustion chamber into a furnace comprising the steps of:

circulating a cooling liquid in the burner about the combustion chamber to cool at least a portion of the burner,

injection a fluid hydrocarbon fuel into a combustion chamber of the burner mounted to a furnace,

injecting an oxygen based gas having an oxygen content greater than atmospheric air into the combustion chamber,

mixing the oxygen based gas with the fuel in the combustion chamber to form a flame in the combustion chamber,

emitting the flame from the combustion chamber of the burner toward the furnace, and

injecting the oxygen based gas into the combustion chamber through an oxygen based gas passage to form a zone of reduced pressure of the oxygen based gas in the burner, the zone being in communication with the furnace thereby inducing with the zone of reduced pressure the movement of some of the furnace gas from within the furnace through a passage within the liquid cooled portion of the burner and into the flame in the combustion chamber to reduce the temperature of the flame in the combustion chamber before the flame passes into the furnace.

5,062,790

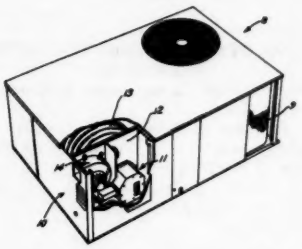
BURNER SOUND REDUCTION ENCLOSURE

Gregory C. Loberger, Dallas, Tex., and Jay L. Slind, Superior, Wis., assignors to Lennox Industries Inc., Carrollton, Tex.

Filed Mar. 9, 1990, Ser. No. 490,926

Int. Cl.[5] F23D *11/40*

U.S. Cl. 431—114 **6 Claims**



1. For use with a furnace having an outer housing, a combustion chamber within said housing, a burner associated with said combustion chamber and adapted to communicate with a source of fuel, means for supplying air to the combustion chamber, said fuel and said air being ignited in the combustion chamber, the improvement characterized by a sound reduction enclosure means secured within said housing, said sound reduction enclosure means including a muffler portion defining an elongated air passage having an air opening at one end and a baffle in said elongated air passage, said sound reduction enclosure means comprising a generally octagon-shaped enclosure that contains the noise emission from the combustion chamber and avoids harmonic/pure tone resonance, said air opening to the muffler portion being restricted and the elongated air passage being serpentine to eliminate direct sound emission from said air opening, said muffler portion being constructed and arranged so as to redirect sound emission toward the source, the sound reduction being on the order of 7–16 db in the 63–250 Hz range as compared to the same furnace without the sound reduction enclosure.

5,062,791

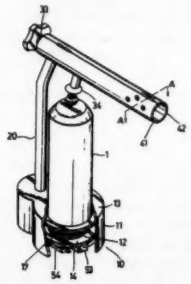
GAS BLOWTORCH

Charg-Shing Liou, No. 647, Fu-Hsing Rd., Fu-Hsing Li, Tsao-Tun Chen, Nan-Tou Hsien, Taiwan

Filed Apr. 1, 1991, Ser. No. 678,218

Int. Cl.[5] F23Q *7/12*

U.S. Cl. 431—266 **6 Claims**



1. A blowtorch, comprising:

a replaceable gas cylinder;

a base including a hollow body having an open top end and defining a hollow space, and a first plate covering said open top end and having an opening to slidingly receive a lower portion of said gas cylinder;

a tubular support rod extending perpendicular to and up-

ward from a portion of said first plate which is spaced from said opening;

a torch head mounted horizontally on a distal end of said tubular support rod, said torch head having a front end, a rear end, a gas outlet formed on said front end, a gas regulating means provided on said rear end to control gas flow through said gas outlet, and a downwardly extending gas inlet means engaging said gas cylinder to permit controlled release of gas contained in said gas cylinder through said gas outlet;

a protective cover assembly longer than and detachably fitted over said torch head, said protective cover assembly including a pair of elongated casing halves, which casing halves are hinged together on one side, and releasably secured to one another on the other side;

a spark igniter means mounted on said torch head; and

means for generating a high voltage output to trigger said spark igniter means to produce a spark;

whereby, gas released at said gas outlet mixes with air to form a combustible mixture, said spark produced by said spark igniter means ignites the combustible mixture to produce a flame output.

5,062,792

HYBRID BURNER FOR A PRE-MIXING OPERATION WITH GAS AND/OR OIL, IN PARTICULAR FOR GAS TURBINE SYSTEMS

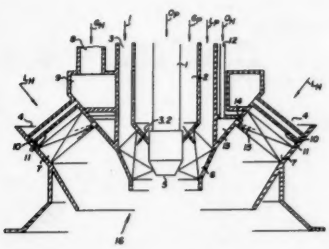
Helmut Maghon, Mülheim/Ruhr, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 148,447, Jan. 26, 1988, abandoned. This application Oct. 20, 1989, Ser. No. 425,432

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702181

Int. Cl.[5] F23Q 9/00

U.S. Cl. 431—284 11 Claims



1. Burner for operation with gas and/or oil having a burner outlet, comprising a central pilot burner system operble with gas and/or oil fuel; and an annular main burner system surrounding said pilot burner system and carrying a primary air flow, said main burner system including a multiplicity of first nozzles for admixing gas with the primary air flow for pre-mixing gas and air upstream of the burner outlet, and a plurality of second inlet nozzles for admixing oil into the primary air flow for pre-mixing oil and air upstream of the burner outlet, and said pilot burner system including means for feeding inert substances.

5,062,793

DEBONDING INSTRUMENT FOR ORTHODONTIC BRACKETS

James D. Cleary, and Robert P. Eckert, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 8, 1989, Ser. No. 404,954

Int. Cl.[5] A61C 3/00

U.S. Cl. 433—3 7 Claims

1. An instrument for debonding an orthodontic bracket having occlusal and gingival wings from a tooth comprising:

a body;

a lever movably connected to said body;

a pair of arms connected to said lever and each having a pulling section, said pulling sections adapted to engage the bracket behind both of the occlusal and the gingival wings and exert a pulling force on the occlusal and gingival wings simultaneously upon movement of said lever relative to said body; and

a pair of reaction supports connected to said body and extending in an occlusal-gingival direction contacting the tooth along the mesial and distal sides of the bracket when both of said pulling sections are in engagement with the bracket behind the occlusal and gingival wings.

5,062,794

ORTHODONTIC APPLIANCE WITH SHOULDER SUPPORT FOR LIGATURE

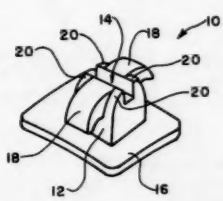
Fujio Miura, Tokyo, Japan, assignor to GAC International, Inc., Central Islip, N.Y.

Filed Apr. 2, 1990, Ser. No. 503,293

Claims priority, application Japan, Jun. 20, 1989, 1-155895

Int. Cl.[5] A61C 3/00

U.S. Cl. 433—10 17 Claims



1. An orthodontic appliance including a bracket portion, comprising:

an archwire slot defined in the bracket portion, the archwire slot extending substantially in the mesial-distal direction of the appliance and being adapted to receive an archwire therein, the bracket portion including four shoulders on the free ends thereof, two shoulders being located on opposite sides of the archwire slot with respect to each other on the mesial end of the appliance and the other two shoulders being located on opposite sides of the archwire slot with respect to each other on the distal end of the

appliance, each shoulder defining a supporting surface, thus forming two supporting surfaces located on either side of the archwire slot on the mesial end of the appliance and two supporting surfaces located on either side of the archwire slot on the distal end of the appliance, each supporting surface supporting a ligature thereon spaced away from an archwire received within the archwire slot to permit the appliance to move relative to the archwire during orthodontic treatment.

5,062,795

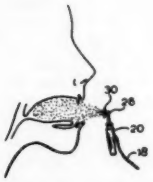
THERAPEUTICALLY CARING FOR THE MOUTH AND THROAT

Philippe G. E. Woog, Villa Le Sequoia, Vesenaz, Switzerland

Continuation of Ser. No. 64,659, Jun. 22, 1987, abandoned. This application Apr. 4, 1990, Ser. No. 504,695

Int. Cl.[5] A61G *17/02*

U.S. Cl. 433—80 **11 Claims**



1. An apparatus for wound lavage and for moisturizing and therapy of the oral cavity and throat, comprising:

a liquid pulse generator;

a spray break-up nozzle connected to said liquid pulse generator including means for setting a discharge rate of said nozzle to between 10 and 100 ml/minute and a pin-hole discharge opening designed for emitting a nebulized fine spray pattern of relatively small droplets in the form of fine mist under pressure and consisting essentially of liquid droplets small enough to prevent harm to tissues of the mouth and throat.

5,062,796

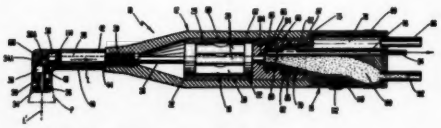
DENTAL HANDPIECE

Neil A. Rosenberg, 10 Hussey Farm Rd., Nantucket, Mass. 02554

Filed Jul. 17, 1990, Ser. No. 553,382

Int. Cl.[5] A61C *1/10, 17/02, 3/02, 1/02, 3/06;* A61G *17/02*

U.S. Cl. 433—82 **16 Claims**



1. A dental handpiece comprising:

a casing having front and rear ends and defining a front-to-rear extending axis,

a rotatably driven output member disposed at said front end of said casing and adapted to removably carry a rotary dental tool,

hollow drive shaft means mounted in said casing for rotation about said front-to-rear extending axis and being operably connected to said output member to drive the latter, said hollow drive shaft means defining an internal conduit,

an air-driven rotor connected to said hollow drive shaft means for transmitting rotary motion thereto,

means situated within said casing and communicating with said hollow drive shaft means for introducing a flowable cleaning agent into said internal conduit defined by said hollow drive shaft means,

means for supplying pressurized air to said rotor for pneumatically rotating said hollow drive shaft means and said output member, and for supplying pressurized air into said internal conduit defined by said hollow drive shaft means for pneumatically forcing cleaning agent through said internal conduit toward said output member.

5,062,797

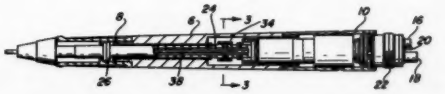
ALLOY BEARING FOR DENTAL SCALER

Donald I. Gonser, Lancaster, Pa., assignor to Den-Tal-Ez, Inc., Audubon, Pa.

Filed Sep. 5, 1990, Ser. No. 578,651

Int. Cl.[5] A61C *3/08*

U.S. Cl. 433—118 **14 Claims**



1. In a dental scaler having a rotor rotatable about a shaft and operably engageable therewith to produce vibrations, the improvement comprising a nickel-boron alloy layer comprising from about 98.5 to about 99.5 weight percent nickel and from about 1.5 to about 0.5 weight percent boron, based on the total weight of said nickel-boron alloy, interposed between the rotor and the shaft to provide a wear resistant, low friction bearing surface.

5,062,798

SIC BASED ARTIFICIAL DENTAL IMPLANT

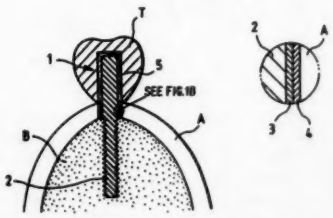
Kazuto Tsuge; Masateru Hattori; Kazuo Kondo, and Yoshimasa Shibata, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Apr. 26, 1989, Ser. No. 343,207

Claims priority, application Japan, Apr. 27, 1988, 63-102797; May 18, 1988, 63-119269

Int. Cl.[5] A61C *8/00*

U.S. Cl. 433—201.1 **7 Claims**



1. An artificial radix dentis comprising a first portion adapted to be buried in an alveolar bone and a second portion adapted to contact a gingiva, wherein at least an outermost layer of said first portion consists essentially of a SiC-based ceramic material.

5,062,799

INTERFACE MATRIX FOR DENTAL RESTORATION

Frank L. Duncan, 210-15 Northern Blvd., Bayside, N.Y. 11361, and Vincent Chiaramonte, 113 Mayfield Dr., Mastic Beach, N.Y. 11951

Filed Oct. 13, 1989, Ser. No. 420,943
Int. Cl.[5] A61C 5/00
U.S. Cl. 433—215 3 Claims

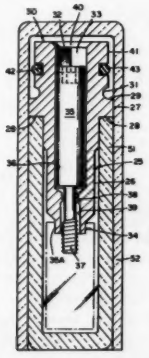
1. The process of applying a dental surface restoration matrix to the face of an existing natural tooth, comprising the following steps; a. lubricating the surface of the natural tooth, b. forming a glass filament matrix having inner and outer surfaces on the natural tooth, coating the matrix with a first curable material on the outer face and a second curable material on the inner face, c. curing the matrix assembly, d. removing the matrix assembly from the natural tooth, e. applying composite surface material of the proper color to the first material on the outer surface of the matrix, f. replacing the matrix assembly on the natural tooth with a bonding agent.

5,062,800

DENTAL IMPLANT HANDLE, AND DENTAL IMPLANT PACKAGE INCLUDING A DENTAL IMPLANT HANDLE

Gerald A. Niznick, Encino, Calif., assignor to Core-Vent Corporation, Encino, Calif.

Filed Mar. 21, 1990, Ser. No. 496,610
Int. Cl.[5] A61C 5/00
U.S. Cl. 433—229 15 Claims



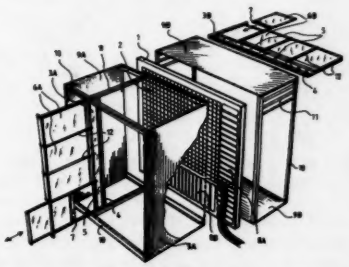
1. A handle adapted for holding a dental implant comprises a body section including a middle portion adapted to fit within and to close a container for said implant, a first end portion connected to said middle portion and including implant-engaging means comprising a multi-sided configuration adapted to engage a complementary multi-sided configuration on a dental implant, and a second end portion connected to said middle portion and including means for engaging an implant insertion device, said body section having an internal passage adapted for receiving shaft means adapted for connecting said implant to said implant-engaging means, and shaft means including means for holding an implant to said implant-engaging means when said shaft means is inserted into said internal passage, and connected to an implant.

5,062,801

FUNCTION UNIT IN WHICH CIRCUIT BOARDS ARE MOUNTED ON A CENTER PLANE BY WAY OF DISTRIBUTION BOARDS

Sture G. Roos, Bergshamra, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Sweden

Filed Sep. 14, 1990, Ser. No. 582,355
Claims priority, application Sweden, Oct. 2, 1989, 8903228
Int. Cl.[5] H05K 1/14
U.S. Cl. 439—61 20 Claims



1. A function unit for electronic equipment, comprising:

a center plane having electrical contact pins mounted thereon over a substantial portion of its surface area, said contact pins being arranged in rows and columns on said center plane to form groups, said contact pins being electrically insulated form the center plane and including contact pins disposed along one edge margin of the center plane in a first terminal field, said first terminal field extending longitudinally along substantially the whole of said one edge margin and being accessible from one side of the center plane, said first terminal field being adapted to be connected with at least incoming and outgoing signal lines and current supply lines;

a plurality of distribution boards adapted to be mounted substantially perpendicularly to and on opposite sides of said center plane, each of said distribution boards being provided with a first electrical contact device along one edge thereof that is adapted to face towards the center plane and being provided with at least one second electrical contact device along an opposite edge thereof, said first electrical contact devices being adapted to mate with said contact pins; and

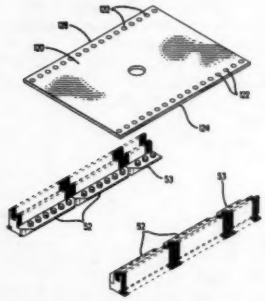
a plurality of circuit boards, each of said circuit boards being provided with a connection device for connection to one of said second electrical contact devices on said distribution boards, said circuit boards being adapted to be positioned in a plane substantially parallel to the plane in which lies the respective distribution board to which the circuit board is to be attached, said distribution boards extending transversely across a substantial portion of the center plane and being provided with means for effecting the distribution of electrical signals to, from the between the circuit boards, the distribution boards adapted to be mounted on said one side of the center plane being adapted to be positioned substantially parallel to the longitudinal extent of the first terminal field, the distribution boards adapted to be mounted on the opposite side of the center plane being adapted to be positioned substantially perpendicular to the longitudinal extent of the first terminal field.

5,062,802

CONTACT MODULE FOR A LOW HEIGHT MULTI-CHIP CARRIER SOCKET

Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 1, 1990, Ser. No. 608,122
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—72 21 Claims



1. A contact module for arranging with another similar contact module to form a connector for electrically connecting the leads of a component to respective pads on a substrate, wherein the leads are spaced apart and projecting from a peripheral edge of the component, and wherein a positioning means is included for positioning both said contact module and said similar contact module with respect to said pads only during assembly of said modules in said forming of said connector, said positioning means being separable from said modules thereafter, comprising:

(a) a body having a longitudinal axis and a plurality of slots formed lateral to said longitudinal axis;

(b) a plurality of contacts, one for each of said slots and arranged for electrically connecting some of said leads to respective ones of said pads on said substrate, each said contact including a terminal portion arranged to electrically engage a respective said pad and a contacting portion arranged to electrically engage a respective said lead;

(c) locking means for urging each said lead into pressing electrical contact with said contacting portion of a respective one of said contacts;

(d) means for engaging features on said positioning means for aligning said body therewith.

5,062,803

PLUG PULLER

Perry C. Howard, deceased, late of Naples, and by Moses W. Howard, 1959 Fourth Street Ct., Naples, both of Fla. 33940

Filed Oct. 15, 1990, Ser. No. 596,962
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—160 20 Claims

1. A device for disengaging a plug member from a receptacle, comprising:

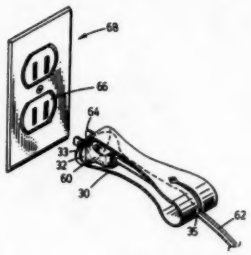
an elongated strap member, said strap member having flat faces for latching together ends of said strap member; and

an aperture formed in the strap member for each portion of said plug member that is to be inserted into said receptacle, each aperture being formed so as to operatively engage about its corresponding portion of said plug member to be inserted into said receptacle, said strap member being mounted on said plug member so as to form a loop thereabout so that said loop can be grasped and pulled at a rear portion thereof at a distance from said plug member to disengage said plug member from said receptacle;

and wherein:

said elongated strap member is made of an electrically non-conductive material and has a central portion and two end portions located on opposite sides of said central portion,

at least one of said central and end portions having an elongated aperture through which said plug member and an electrical cord attached thereto can be threaded,



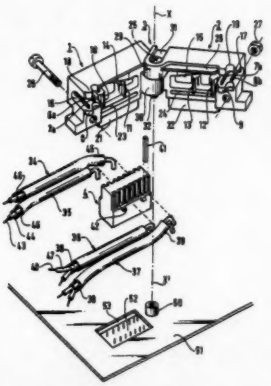
at least one of said central and end portions having a set of two or more apertures accepting prongs of said plug member.

5,062,804

METAL HOUSING FOR AN ELECTRICAL CONNECTOR

Daniel Jamet, Nozay, and Christian Guiberteau, Longjumeau, both of France, assignors to ALCATEL CIT, Paris, France

Filed Nov. 23, 1990, Ser. No. 617,841
Claims priority, application France, Nov. 24, 1989, 89 15481
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—394 8 Claims



1. Metal housing for an electrical connector comprising two facing metal half-housings and assembly means for enclosing a connector plug adapted to be inserted into a connector socket and to be connected to at least one cable comprising a conductive braid covered with insulation and surrounding at least one insulated electrical conductor projecting beyond the end of the braid,

wherein each half-housing comprises:

at least one orifice on the periphery of the half-housing and having an open contour when the two half-housings are open and a closed contour when they are closed, said closed contour having dimensions adapted to allow at least one cable to pass through it;

at least one fork-shape projection in said at least one orifice, said projection being integral with said half-housing and constituting an insulation-displacement contact for establishing an electrical connection between the

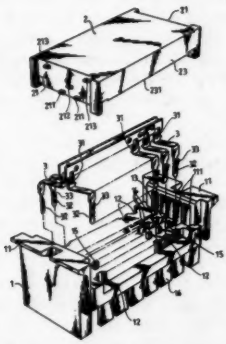
half-housing and the braid of a cable and for retaining the cable.

5,062,805

STRUCTURE OF CABLE CONNECTOR FOR MATCHING WITH IC MOUNTING SEAT

Yun-Yu Liu, Taipei; Hsiao-Lei Shih, Hsin Tien; Yang-Chih Chyou, Chung Ho, and Ming-Shing Laiw, Yun Lin Hsien, all of Taiwan, assignors to Pan-International Industrial Corp., Taipei, Taiwan

Filed Nov. 27, 1990, Ser. No. 618,413
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—404 2 Claims



1. A cable connector, comprising a plug seat for mounting in an IC mounting seat of an electric control circuit of a machine, an upper cover connected to said plug seat at the top, and a terminal assembly fastened therebetween for connection thereto of a bus line from another machine;

said plug seat comprising a plurality of plug pins at two opposite sides for fastening in a plurality of plug holes made on said IC mounting seat, two brackets at two opposite ends, said brackets having each a plurality of parallel recesses at an inner side, two rows of mounting slots at two opposite sides within said plug pins, an elongated locating seat at a top portion middle, said locating seat having a plurality of grooves alternatively vertically disposed at two opposite sides and obliquely aligned with said mounting slots, and a row of projecting strips longitudinally disposed at a top portion between said locating seat and one of said two rows of mounting slots;

said upper cover comprising a large face plate, two opposite end walls at two opposite ends, a shorter side wall at one side and a longer side wall at an opposite side, said face plate having a plurality of posts extending downward therefrom at two opposite ends, said end walls having each a plurality of projecting blocks respectively disposed at lower, middle and upper positions;

said terminal assembly comprising a plurality of contact ends respectively obliquely curvilinearly extending downward from a plurality of connecting racks; and

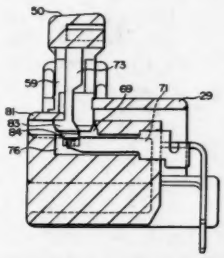
wherein said contact ends of said terminal assembly are respectively fastened in said mounting slots, said connecting racks of said terminal assembly are respectively vertically fastened in said grooves of said locating seat, the projecting blocks at lower and middle positions on said end walls of said upper cover are respectively fastened in said parallel recesses of said brackets of said plug seat to define a bus line mounting hole between the bottom edge of said shorter side wall of said upper cover and a top edge of said connecting racks of said terminal assembly for mounting a bus line in the space defined within said posts of said face plate, permitting said connecting racks of said terminal assembly to be further squeezed by said upper cover to respectively pierce in said bus line and electrically connect the conductors thereof.

5,062,806

ELECTRIC CONNECTOR

Akira Ohno, Tokyo; Kunihiko Muraoka, and Wataru Nakazato, both of Gunma, all of Japan, assignors to Japan Aviation Electronics Industry, Limited and Fuji Jukogyo Kabushiki Kaisha, both of, Japan

Filed Dec. 14, 1990, Ser. No. 628,335
Claims priority, application Japan, Dec. 19, 1989, 1-145461[U]
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—490 7 Claims



1. An improved electric connector comprising:

at least one socket connector;

a pin connector provided with at least one receiving hole adapted for receiving said socket connector;

a detection lever provided with a plurality of legs extending towards said receiving hole and coupled to said pin connector in an arrangement such that said legs should intrude into said receiving hole to rest in a corresponding recess formed in said socket connector when said socket connector is completely received in said receiving hole of said pin connector and said detection lever is depressed against said pin connector;

at least one pair of switch contacts arranged within said pin connector; and

at least one push rod coupled to said detection lever so as to push and open said switch contacts, only when said detection lever is depressed and said socket connector is completely received in said receiving hole of said pin connector.

5,062,807

LIGHTED ELECTRICAL CONNECTOR PERMITTING MULTI DIRECTIONAL VIEWING

Robert J. Guss, III, Glen Ellyn, Ill., assignor to Woodhead Industries, Inc., Northbrook, Ill.

Filed Oct. 22, 1990, Ser. No. 600,916
Int. Cl.[5] H01K *3/00*
U.S. Cl. 439—490 10 Claims

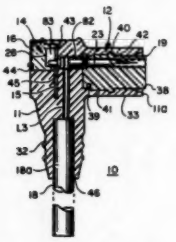
1. A quick-disconnect connector assembly for completing an electrical circuit to connect a functional device to a load, and for indicating a continuity condition for the electrical circuit, said connector assembly comprising:

connector body means including a lens portion, said connector body means having a rear surface, a top surface and first and second side surfaces;

contact means including a plurality of contact elements located within said connector body means;

a multi-conductor cable including a plurality of electrical conductors, a terminating portion of said cable extending into said connector body means, at least first and second conductors of said plurality of conductors being electrically connected to first and second ones of said contact elements within said connector body means;

indicating circuit means within said connector body means and including first and second light sources located adjacent to said lens portion, said first light source being energized to indicate a first continuity condition when power is connected to said electrical circuit and said second light source being energized to indicate a second continuity condition when power is applied to the load; said first light source emitting light in a first frequency band and said second light source emitting light in a second frequency band, said lens portion having a forward surface, an upper surface and first and second side surfaces and being constructed and arranged to transmit light in said first frequency band at least through portions of its forward and upper surfaces and through said first side surface



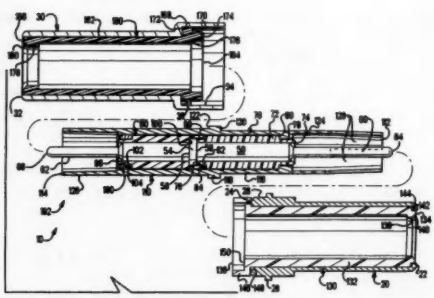
and to transmit light in said second frequency band at least through portions of its forward and upper surfaces and through said second side surface of said lens; said indicating circuit means being electrically connected to said contact means within said connector body means to enable one of said light sources to be energized whenever the continuity condition associated therewith is provided, said lens portion being of a light transmissive material and defining a plurality of light transmitting surfaces which are oriented in at least two different respective directions, whereby whenever one of said continuity conditions is provided, light produced by said light source associated with said condition is transmitted through said lens portion in different directions.

5,062,808

ADAPTER FOR INTERCONNECTING SOCKET CONNECTORS FOR TRIAXIAL CABLE

Robert C. Hosler, Sr., Marysville, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 12, 1991, Ser. No. 684,719
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—580 **12 Claims**



1. An adapter assembly for interconnecting two triaxial connectors of the type having an inner signal contact, an intermediate ground therearound, and an outer conductor therearound, comprising:

an inner contact member disposed within a first dielectric sleeve means and coaxially disposed within an intermediate contact member, all of which is disposed within a second dielectric sleeve means and coaxially within an outer contact means;

said inner contact member including a body section extending between forward and rearward contact sections and an annular collar around said body section cooperable with stop surfaces of said first sleeve means to assure precise locating of first and second contact ends with respect to forward and rearward stop means of said first sleeve means;

said intermediate contact member being tubular and having forward and rearward ends and including at least a first stop means therewithin cooperable with a corresponding one of said forward and rearward stop means of said first sleeve means to assure precise locating of said first sleeve means therewithin, in conjunction with a retention means firmly securable within said intermediate contact member at a selected location therealong and cooperable with the other of said forward and rearward stop means of said first sleeve means;

said intermediate contact member further including an annular collar therearound cooperable with stop surfaces of said second sleeve means to assure precise locating of said first and second contact ends of said inner contact member held within said intermediate contact member, with respect to forward and rearward stop means of said second sleeve means; and

said outer contact means being tubular and having forward and rearward ends and being continuous axially along the assembly at least after assembly thereof and including forward and rearward stop means therewithin cooperable with said forward and rearward stop means of said second sleeve means to assure precise locating of said first and second contact ends of said inner contact member held within said intermediate contact member within said outer contact means;

said first sleeve means adapted to provide dielectric material about said inner contact adapted to provide dielectric material about said intermediate contact continuously therealong;

whereby the inner contact member, first sleeve means, intermediate contact member, second sleeve means and outer contact means define a series of interrelated precisely located stop means when assembled to assure precise locating of contact sections of said inner contact with respect to ends of the adapter assembly and indirectly with respect to corresponding contact means of opposing triaxial connectors matable therewith.

5,062,809

HIGH-FREQUENCY CONNECTOR AND METHOD OF MANUFACTURING THEREOF

Katsuhiko Sakamoto, Kamakura; Akira Kawaguchi, Musashimurayama, and Yasuhiro Ishikawa, Machida, all of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1991, Ser. No. 669,802
Claims priority, application Japan, Mar. 15, 1990, 2-62763
Int. Cl.[5] H01R *13/54*
U.S. Cl. 439—581 **8 Claims**

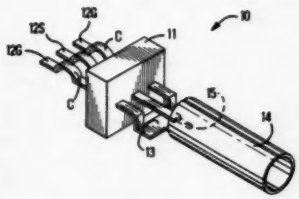
1. An electrical connector, comprising:

outer plate-shaped contacts and a center plate-shaped contact;

a dielectric member secured onto said plate-shaped contacts maintaining said plate-shaped contacts in spaced relationship and in the same plane so that the plate-shaped contacts are coplanar;

a coupling part at the other ends of the outer plate-shaped contacts interconnecting the outer plate-shaped contacts;

a receptacle contact member as part of said coupling part; and



a pin contact member at the other end of said center plate-shaped contact disposed with said receptacle contact member at the center thereof.

5,062,810

PLUG INSERT FOR A METAL TUBE HOUSING

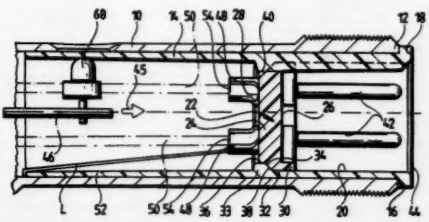
Peter Kroll, Neckartailfingen, Fed. Rep. of Germany, assignor to Gebhard Balluff Fabrik feinmechanischer Erzeugnisse GmbH & Co., Fed. Rep. of Germany

Filed Aug. 27, 1990, Ser. No. 573,901

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928791

Int. Cl.[5] H01R *13/40*

U.S. Cl. 439—589 **13 Claims**



1. A plug inset for a metal tube housing comprising:

a contact carrier with plug pins protruding from a first side thereof and solder terminals protruding from a second side thereof opposite said first side; and

a protective sleeve adapted to be inserted into said metal tube housing for holding said contact carrier;

said protective sleeve having:

a receptacle adapted to receive and retain said contact carrier to form a unitary structure for mounting said plug pins and solder terminals within said metal tube housing, said receptacle containing means therein for limiting the travel of the contact carrier into the receptacle,

a front extension adapted to project from the first die of said contact carrier in a first direction parallel to said plug pins when the contact carrier is retained in said receptacle, and

a rear extension adapted to project from the second side of said contact carrier in a second direction opposite said first direction and beyond said solder terminals when the contact carrier is retained in said receptacle.

5,062,811

CAPACITIVE COUPLED CONNECTOR FOR PCB GROUNDING

John A. Hackman, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 30, 1990, Ser. No. 605,613

Int. Cl.[5] H01R *13/66*

U.S. Cl. 439—620 **6 Claims**

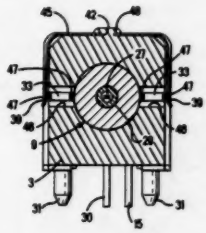
1. An electrical connector form mounting to a printed circuit board, said connector comprising:

an insulated inner signal transmittal contact;

an insulated outer conductive shell encircling the contact;

a conductive post insulated from the shell and adapted for insertion into the board;

an electric capacitor element held in contact with the shell; and



a conductive clip adapted to engage the capacitor element;

said clip being maintained in contact with the post to establish a capacitive electrical coupling of the shell, through the capacitor element and the post, to the board.

5,062,812

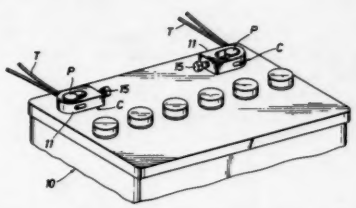
BATTERY CABLE CONNECTOR

William H. Allen, P.O. Box 178, Tomball, Tex. 77375, assignor to William H. Allen, Houston, Tex.

Continuation of Ser. No. 501,012, Mar. 29, 1990, abandoned. This application Oct. 22, 1990, Ser. No. 601,880

Int. Cl.[5] H01R *11/01*

U.S. Cl. 439—756 **6 Claims**



1. A connector for electrically connecting the bared end of one or more battery cables to a terminal post of a storage battery, comprising

a body having top and bottom walls, side walls, and end walls,

an elongate slot in the bottom wall of a width to fit over the terminal post,

an opening connecting the side walls and intersecting one end of the slot near one end wall of the body to permit the bared end of each such cable to be inserted into the opening for disposal between said one end of the slot and one side of the post, and

a threaded hole connecting the other end wall and other end of the slot, and

a bolt threadedly received within the hole for inward and outward movement toward and away from the one end of the slot so as to permit its inner end to tightly engage with the other side of the post, when moved inwardly, so as to compress the bared ends of the cable between said one end of the slot and one side of the post,

said inner end of the bolt being of a size for passing into and out of the threaded hole.

5,062,813

STRUCTURE OF RECEPTACLE TERMINAL MATERIAL STRIP

Yun-Yu Liu, Taipei, and Juinn-Horng Lu, Yunlin Hsien, both of Taiwan, assignors to Pan-International Industrial Corp., Taipei Hsien, Taiwan

Filed Aug. 29, 1990, Ser. No. 574,090
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—857 3 Claims

1. A receptacle terminal material strip, comprising a plurality of terminals for fastening in terminal seats of a rubber core of a receptacle, characterized in that:

said terminals comprise each integrally:

a plug terminal retaining portion at the front, comprising a folded frame having upper and lower frame portions formed by bending the front end of the terminal backward each frame portion comprising side arms and a spring strip between the side arms, the spring strip relatively obliquely projecting forward and inward for holding a plug terminal, the upper and lower side arms being substantially parallel and the frame being open at each side between the upper and lower side arms;

a fastening portion at the middle, having two wing projections at two opposite sides for fastening said terminal in either of said terminal seats in said rubber core; and

an electrical connection portion at the rear end, being an elongated rod having a substantially U-shaped cross section and a plurality of indentations for breaking according desired length.

5,062,814

OUTBOARD MOTOR

George Reynolds, Surrey, Canada, assignor to Ronald F. Taylor, Richmond, Canada

Filed Jul. 12, 1989, Ser. No. 379,578
Int. Cl.[5] B63H *16/20*
U.S. Cl. 440—31 6 Claims

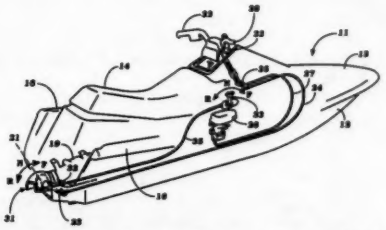
1. A manually operated outboard motor which is removably attachable to a boat comprising an upper housing and a lower skeg portion operably connected to said upper housing, a propeller operably mounted in said lower skeg portion, a plurality of shaft means extending between said propeller and said upper housing, gear means between said plurality of shaft means, a crank rotatable about a vertical axis in said upper housing and being operably connected to said plurality of shaft means, said crank having a handle operatively attached thereto, said crank and crank handle being manually rotated and operating to power said plurality of shaft means and said propellor and including steering means, separate from the crank, for changing the orientation of the propellor relative to said boat for steering said boat, said steering means further being operable to be moved to positions forwardly or rearwardly of said housing independently of the movement of said lower skeg portion and comprising a handle which is capable of pivotal movement relative to the housing about a substantially horizontal axis extending through said upper housing.

5,062,815

SHIFT CONTROL FOR SMALL WATERCRAFT

Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 27, 1989, Ser. No. 441,381
Claims priority, application Japan, Nov. 28, 1988, 63-301927
Int. Cl.[5] B63H *11/11*
U.S. Cl. 440—41 4 Claims



1. A small watercraft having a hull, a rider's area defining an area to accommodate a rider, a throttle control positioned contiguous to the rider's area and on one side thereof for controlling the speed of said watercraft by the hand of a rider, said throttle control being spring biased to an idle position and requiring the pressure of the hand of the rider to hold the engine speed in any speed other than idle speed, and a drive control for effecting operation of said watercraft in either forward drive mode or reverse drive mode in proximity to that hand of a rider in said rider's area on that one side of the small watercraft said drive control being located on said one side of the small watercraft and spaced a sufficient distance below said throttle control such that a rider can operate only one of said controls with the same hand at a given time.

5,062,816

AQUATIC SPORTING DEVICE

Andrew Berglund; James A. James, both of Northfield, and James B. Easley, Minneapolis, all of Minn., assignors to Zonco, Inc., Northfield, Minn.

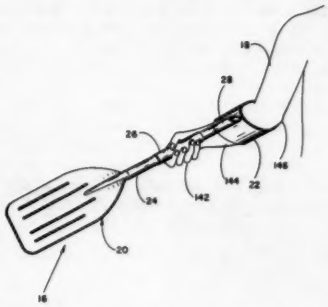
Filed Jul. 2, 1990, Ser. No. 546,914
Int. Cl.[5] B63H *16/04*
U.S. Cl. 440—101 17 Claims

1. An aquatic sporting device suited for manipulation with one arm, said device including:

an elongate, longitudinally extended shank having proximal and distal ends, and a hand gripping region along the shank between the proximal and distal ends;

a rigid bracing means including a support segment mounted at the proximal end of the shank and extended away from the shank and a bracing segment mounted to the support segment, said support segment supporting the bracing segment parallel to the shank and proximally and laterally spaced apart from said proximal end, positioned for bearing against an elbow of the arm when a hand of the arm is closed about the shank along the gripping region, with a forearm portion of the arm in substantially parallel relation to the shank, and shaped to permit full flexing of the

elbow with the bracing segment bearing against the elbow; and



a working implement mounted at the distal end of the shank for lateral movement with the shank by laterally moving the hand gripping the shank while the bracing segment bears against the elbow.

5,062,817

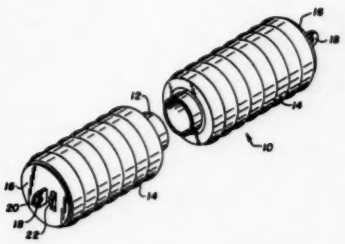
BOOMSTICK

Harry G. Wearne, Site 415, Comp. 14, R.R. #4, Courtenay, B.C., Canada V9N 7J3

Filed Mar. 15, 1991, Ser. No. 669,750

Int. Cl.[5] B63B *7/04*

U.S. Cl. 441—45 **5 Claims**



1. A boomstick for use in flexibly joining with other boomsticks floating in water to contain a plurality of logs, the boomstick comprising:

a hollow pipe having an outside diameter to permit installation of unpressurized tires on the pipe,

a plurality of unpressured tire installed on the pipe,

end discs, larger in diameter than the pipe, welded at both ends of the pipe to retain the tires on the pipe and provide a sealed pipe to float in water, and

attachment means on the boomstick for connection by attaching chains.

5,062,818

MINIATURE BULB ASSEMBLY AND METHOD OF PRODUCING THE SAME

Takasi Wasimoto, Yokohama, and Morio Kimura, Fukushima, both of Japan, assignors to Stanley Electric Co., Ltd. and Alpine Electronics Inc., both of, Japan

Division of Ser. No. 573,538, Aug. 27, 1990. This application Jan. 11, 1991, Ser. No. 640,157

Claims priority, application Japan, Aug. 29, 1989, 1-222578

Int. Cl.[5] H01J *9/28, 9/30, 9/34*

U.S. Cl. 445—22 **3 Claims**

1. A method for producing miniature bulb assemblies each adapted to be mounted on a base plate comprising:

providing a socketless miniature bulb having a pair of lead wires extending therefrom,

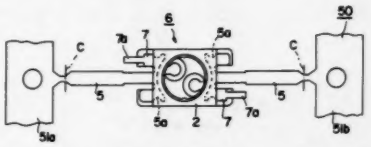
a base member molded of a synthetic resin, said base member having upper and lower surfaces and first and second pairs of opposing sidewalls and being formed with a bulb receiving recess in a substantially central portion of and extending downwardly from said upper surface,

a pair of lead wire holes extending from the bottom of said recess to said bottom surface and a pair of terminal grooves arranged on opposite sides of said bulb receiving recess, and

a pair of conductive terminal members each comprising an elongated plate-shaped terminal and a base fitting portion, a portion of said elongated plate-shaped terminal and a portion of said base fitting portion each being embedded in said base member during the molding operation, said elongated plate-shaped terminal being bent to extend downwardly in an associated terminal groove so that its free end is directed to said base board for engagement therewith,

further providing a substantially flat metallic sheet,

punching the metallic sheet to form a ladder-like configuration comprising elongated marginal side portions joined by a plurality of spaced substantially parallel spanning



members integrally joined to said marginal side portions and a pair of plate-shaped terminal members each joined to marginal side portions of said sheet, said marginal side portions of said sheet and each adjacent pair of said spanning members enclosing a pair of terminal members, the terminal members each having their terminal portions joined to one of said marginal side portions,

said terminal members extending toward one another so that the base fitting portions are adjacent to but spaced apart from one another,

placing a pair of said terminal members in a molding machine,

molding a base member with synthetic resin about said pair of terminal members so as to embed said adjacent base fitting portion into said base member by an insert molding process,

cutting said pair of terminal members away from said marginal side portions,

bending said terminal portions so that they extend along the sides of the base member,

inserting the lead wires of said socketless miniature bulb into said lead wire holes so that said socketless miniature bulb moves into said bulb receiving recess, and

joining each of said lead wires to an associated one of said terminal members.

5,062,819

TOY VEHICLE APPARATUS

Mitchell K. Mallory, 403 Kinsey St., Richmond, Ind. 47374

Filed Jan. 28, 1991, Ser. No. 646,818

Int. Cl.[5] A63H *29/22*

U.S. Cl. 446—462 **1 Claim**

1. A toy vehicle apparatus comprising,

an elongate vehicle chassis, the vehicle chassis including a forward rotatable axis mounted within a forward portion of the chassis, and a rear axle rotatably mounted within a rear portion of the chassis arranged parallel to the forward axle, with a plurality of forward wheels mounted to the

forward axle, and a plurality of rear wheels to the rear axle,

and

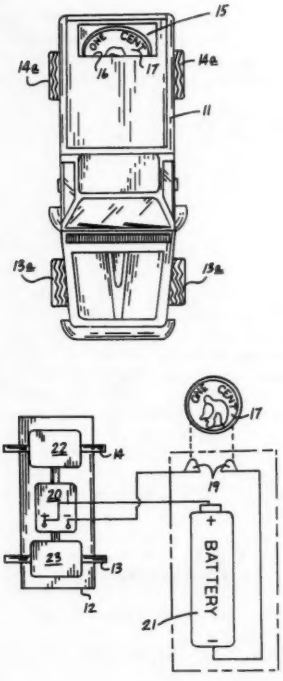
a vehicle body removably mounted relative to and overlying the chassis,

and

wherein the chassis includes a medially positioned drive motor, and a rear gear drive operatively associated with the rear axle, and a forward gear drive operatively associated with the forward axle to effect selective rotation of the forward and rear axle by the forward and rear gear drives, and contact means mounted within the chassis and operatively associated with the vehicle body to effect selective actuation of the drive motor,

and

wherein the contact means includes a plurality of spaced



electrical contacts in electrical communication with a battery, wherein the battery is in electrical communication with the drive motor, whereupon selective electrical communication between the spaced electrical contacts effects selective actuation of the drive motor, and wherein the contact means further includes a coin support plate fixedly mounted on the vehicle body, wherein the coin support plate includes a top surface and the top surface defines an obtuse angle between the top surface and the vehicle chassis, and the coin support plate including a slot mounted at a lower terminal end of the coin support plate, and a further slot mounted within the chassis in alignment with the slot, and a metallic coin disk positionable in contiguous communication with the coin support plate directed through the slot and the further slot to effect selective electrical communication between the spaced electrical contacts.

5,062,820

AUTOMATIC ANIMAL PROCESSING

Russel J. Rankin, Clean Mountain; David J. de Chastel, deceased, late of Virginia by Ann de Chastel, executrix; Graeme L. Wescombe, Manly West; David T. Kerr, Beenleigh; Phillip R. Boyce, Tingalpa; Raymond M. White, Capalaba; Robert W. Tritchler, Manly, and John W. Buhot, Coorparoo, all of Australia, assignors to Commonwealth Scientific & Industrial Research Organisation and Australian Meat & Live-Stock Research & Development Corp., both of, Australia

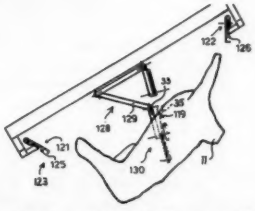
PCT No. PCT/AU88/00496, § 371 Date Aug. 23, 1990, § 102(e) Date Aug. 23, 1990, PCT Pub. No. WO89/05584, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 22, 1988, Ser. No. 566,386

Claims priority, application Australia, Dec. 23, 1987, PI6045

Int. Cl.[5] A22C *11/02*

U.S. Cl. 452—187 **10 Claims**



1. An apparatus for automatically processing an animal carcass, the apparatus comprising suspension means for suspending a carcass in an inverted position with the spine located beneath the carcass and the carcass having an abdominal cavity opening upwardly so as to expose the abdominal side of the diaphragm so that the abdominal viscera lay away from the diaphragm within the abdominal cavity under the weight of the abdominal viscera, the apparatus further comprising a cutting assembly movable relative to the carcass so as to be advanceable into the abdominal cavity adjacent to the diaphragm, the cutting assembly including a cutting support and a cutting means movably mounted to the cutting support for generally arcuate movement about the length of the carcass within the abdominal cavity and being operable during the arcuate movement to cut the diaphragm around the periphery thereof.

5,062,821

ARRANGEMENT OF A PROTECTIVE COVER ON THE SOCKET OF A TRANSMISSION JOINT

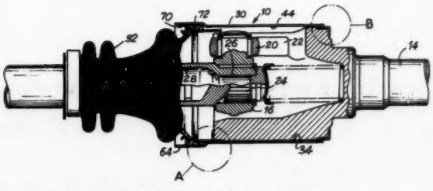
Francois Moulinet, Triel sur Seine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Jun. 19, 1989, Ser. No. 367,712

Claims priority, application France, Jun. 22, 1988, 88 08391

Int. Cl.[5] F16D *3/84*

U.S. Cl. 464—111 **10 Claims**



1. A transmission joint assembly, comprising:

a first shaft having a socket connected thereto, said socket defining at least one pair of rolling tracks;

a second shaft having at least one rolling element connected thereto, said rolling element being received in said pair of rolling tracks;

said socket having an outer wall, and said outer wall having an unmachined outer surface;

said socket further having a first end adjacent said first shaft and a second end adjacent said second shaft;

a protective closing cover having a substantially cylindrical shape mounted on said outer wall of said socket such than an inner wall of said cover is radially spaced from said unmachined surface of said outer wall of said socket;

a gasket interposed between said outer wall of said socket at said first end thereof and said cover; and

a sealing bellows having a free annular edge sealing against said inner wall of said cover at said second end of said socket;

wherein said outer wall of said socket at said second end has a machined cylindrical bearing zone adjacent said unmachined outer surface of said outer wall for mounting and centering said cover thereon; and

wherein an annular ring member is disposed on said machined cylindrical bearing zone of said outer wall of said socket and wherein said free annular edge of said bellows is disposed between said annular ring member and said inner wall of said cover.

5,062,822

DRIVE SYSTEM WITH INTERMEDIATE SHAFT FOR AUTOMOBILES

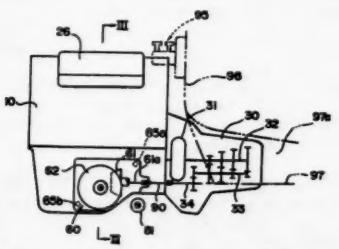
Hiroshi Nakayama, and Toshiyuki Yumoto, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,212

Claims priority, application Japan, Dec. 11, 1987, 62-313825

Int. Cl.[5] F16H *37/08*

U.S. Cl. 475—200 **16 Claims**



1. A drive system for an automobile comprising an engine, a transmission coupled to an output end of the engine, and a final speed reduction gear unit joined to said engine either laterally or downwardly thereof separately from said transmission, comprising, an output shaft of said transmission and an input shaft of said final speed reduction gear unit positioned substantially coaxially with each other and coupled to each other through an intermediate shaft having a solid portion coaxial with and between said input and output shaft, said intermediate shaft being axially movable with respect to said output shaft and said input shaft, and a lock member for locking said intermediate shaft in a position engaging said output and input shafts to connect them, and said intermediate shaft being releasable from said lock member and movable axially until the intermediate shaft disengages from at least one of said output and input shafts.

5,062,823

CONTINUOUSLY VARIABLE TRANSMISSION WITH CONTROLLING BRAKES

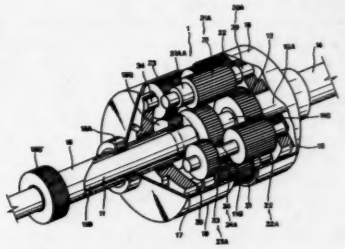
Jong Oh Ra, 2H-1, 265-154, Bokwang Dong, Yongsan-ku, Seoul, and Joon Young Lim, Duckyong Villa KA-204, 141-2, Duckjeong-Ri, Hoecheon-Eup, Yangiu-Kun, Kyungki-do, both of Rep. of Korea

Filed Jul. 9, 1990, Ser. No. 551,772

Claims priority, application Rep. of Korea, Aug. 26, 1989, 89-12212

Int. Cl.[5] F16H *37/06*

U.S. Cl. 475—330 **16 Claims**



9. A variable speed transmission, comprising:

an input shaft **11** with a first section **11A**, a midsection **11B** and a second section **11C** for receiving rotational input;

an input sun gear **11G** mounted between said midsection **11B** and said second section **11C** of said input shaft to enable simultaneous rotation with said input shaft;

an idler gear **12** including a hub **12A** mounted on said second section of said input shaft to enable independent rotation relative to said input shaft;

a differential gear carrier **13** mounted on said hub of said idler gear **12** to enable independent rotation relative to said hub of said idler gear **12**;

a transmission shaft **16** having a first end **16A** and a second end **16C** and being rotatably and coaxially mounted at said mid-section of said input shaft to enable independent rotation relative to said input shaft and with said first end of said transmission shaft **16** terminating in a sun gear **16G** and said second end of said transmission shaft **16** terminating in a sun gear **16G'**;

a differential gear carrier **17** mounted on said transmission shaft **16** to enable independent rotation relative to said transmission shaft **16**;

a plurality of pins **20A** with each pin **20** secured to and interlinking said differential gear carrier **13** and said differential gear carrier **17** to enable simultaneous rotation of said carriers **13** and **17** relative to said input shaft;

a plurality of first differential gears **21A** with each said gear **21** being rotatably mounted on a pin **20**, respectively, of said plurality of pins **20A** and with each said gear **21** being in mechanical communication with said input sun gear **11G**;

a control ring gear **18** rotatably mounted on said transmission shaft **16** with said control ring gear being in mechanical communication with each said gear **21** of said plurality of first differential gears **21A**;

a plurality of rods **24A** with each rod **24** interlinking and being rotatably secured to each said differential gear carrier **13** and said differential gear carrier **17** to enable each rod **24** to rotate about its axis and to enable simultaneous rotation of said carriers **13** and **17** relative to said input shaft;

an output shaft **14** terminating in an output ring gear **15** with said output ring gear **15** being distally mounted on said hub relative to said differential gear carrier **13** to enable independent rotation of said output ring gear and output shaft relative to said hub;

a plurality of second differential gears **22A** with each said gear **22** rotatably mounted on a rod **24** of said plurality of rods **24A** and with each said gear **22** being in simultaneous mechanical communication with a gear **21** of said plurality of first differential gears **21A** and said output ring gear **15**;

a plurality of planetary gears **23A** with each said planetary gear **23** mounted on each said rod **24** of said plurality of rods **24A** which includes a gear **22** of said plurality of second differential gears **22A** and with each said planetary gear **23** of said plurality of planetary gears **23A** being in mechanical communication with said sun gear **16G**;

a circular plate carrier **37** rotatably mounted on said second end **16C** of said transmission shaft **16**;

a circular plate carrier **32** rotatably mounted on said first section **11A** of said input shaft **11**;

a plurality of locking pins **33A** with each said locking pin **33** secured to and interlinking said circular plate carrier **37** and said circular plate carrier **32** to enable simultaneous rotation of said carriers **32** and **37** relative to said input shaft;

a plurality of second planetary gears **35A** with each said planetary gear **35** rotatably mounted on each said locking pin **33** of said plurality of locking pins **33A**;

said sun gear **16G'** being in mechanical communication with each said gear **35** of said plurality of second planetary gears **35A**;

a high speed control ring gear **36** rotatably mounted on said transmission shaft **16** with said ring gear **36** being in mechanical communication with each said gear **35** of said plurality of second planetary gears **35A**;

an input sun gear **11G'** mounted between said first section **11A** and said mid-section **11B** of said input shaft to enable simultaneous rotation with said input shaft;

a plurality of first planetary gears **31A** with each said gear **31** of said plurality of said first planetary gears **31A** rotatably mounted on each said locking pin **33** of said plurality of locking pins **33A** and with each said gear **31** of said plurality of first planetary gears **31A** being in mechanical communication with said input sun gear **11G'**;

a ring gear **34** which is secured against rotation relative to said input shaft **11** with said ring gear **34** being in mechanical communication with each said gear **31** of said plurality of first planetary gears **31A**;

a first brake means **19** for applying rotational resistance to said control ring gear **18** such that in use when said first brake means **19** frictionally engages said control ring gear **18**, the rotation of said control ring gear **18** decreases whereby torque is applied to said output shaft **14** to rotationally initiate said output shaft **14** and upon further activation of said first brake means to stop the rotation of said control ring gear **18**, the rotational speed of said output shaft **14** further increases; and

a second brake means **38** for applying rotational resistance to said high speed control ring gear **36** such that in use when said frictional resistance being applied to said control ring gear **18** is removed and when said second brake means **38** frictionally engages said high speed control ring gear **36**, the rotational speed of said high speed control ring gear **36** decreases resulting in an increase in the rotational speed of said output shaft **14** and upon further activation of said second brake means to stop the rotation of said high speed control ring **36**, the rotational speed of said output shaft **14** exceeds the rotational input of input shaft.

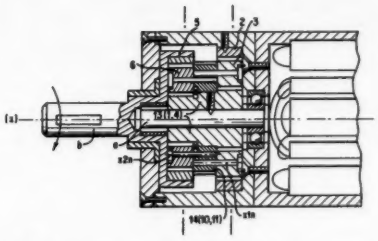
5,062,824

MULTIFUNCTION GEARING MECHANISM

Josef P. Prokopius, 9 Compton Road, Wendover, Bucks HP22 6HR, United Kingdom GR11 UEG

Filed Jan. 27, 1989, Ser. No. 302,241
Int. Cl.[5] F16H *1/46*
U.S. Cl. 475—342 **4 Claims**

1. A multifunction gearing mechanism having two rotational units, a first rotational unit having a first smaller inner rotational member fixed to input shaft rotatably mounted in common axis of rotation, a second larger outer rotational member fixed to stationary housing coaxially on the said common axis to circumferentially encompass said small member, said rotational members being mounted in one and the same radial plane, and at least a third rotational member mounted rotatably between the said first smaller member and the said second outer member as to provide rotational engagement within the first rotational unit; and a second rotational unit having a second smaller inner rotational member fixed also to the said input shaft rotatably mounted in the said common axis of rotation, the said first smaller inner rotational members of the said first and second rotational units being of different sizes, and also a second larger outer rotational member mounted to output shaft coaxially in the said common axis of rotation as to circumferentially encompass said first smaller member, said



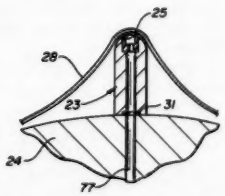
first smaller inner and second larger outer rotational members being mounted in one and the same radial plane, and at least a third rotational member mounted rotatably between said first smaller inner and second larger outer rotational members as to provide rotational engagement within the said second rotational unit, said third rotational members of said first and second rotational units being of different size and each said third rotational member of first and second rotational unit being independently and freely rotating on attributed individual and independent shafts, said shafts being mounted in individual and independent axes to a carrier plate, said carrier plate being rotatably mounted in said common axis of rotation between the said first and second rotational unit and the whole arrangement of said first and said second rotational units being spaced apart and arranged in two radial planes.

5,062,825

APPARATUS AND METHOD FOR THE PRODUCTION OF FLEXIBLE PRODUCTS

David A. Smith, Midland, and Herbert B. Geiger, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 353,932, May 22, 1989, abandoned. This application Aug. 9, 1990, Ser. No. 565,882
Int. Cl.[5] B31B *1/10, 1/12*
U.S. Cl. 493—194 **15 Claims**



1. An apparatus for the continuous production of individual flexible products from a folded web of material comprising:

a source of a continuous folded web of material;

a rotatable product drum having a plurality of sever and seal stations located about the outer periphery thereof for

forming individual bags, each of said sever and seal stations having associated therewith means for severing and sealing said folded web of material;

means for continuously feeding said folded web of material onto the surface of said drum; and

means positioned between adjacent sever and seal stations for tucking said web of material outwardly from the periphery of said drum, said means comprising a series of projections attached to the surface of and extending above the surface of said drum, said projections including means for expansion and contraction comprising a flexible diaphragm communicating with a source of positive air pressure and engaging said web of material, to provide tension relief in said web.

5,062,826

DEVICE FOR LOCKING A BLOOD CENTRIFUGATION CELL ON A CHUCK

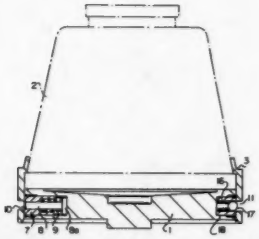
Marco Mantovani, Via Dante Alighieri, 6, 46025 Poggio Rusco (Mantova), and Giorgio Rossetto, Via della Liberta, 5, 45037 Melara (Rovigo), both of Italy

Filed Jul. 6, 1990, Ser. No. 549,472

Claims priority, application Italy, Jul. 14, 1989, 21195 A/89

Int. Cl.[5] B04B *15/00*

U.S. Cl. 494—85 **11 Claims**



1. A device for locking the base of a blood centrifugation cell on a rotatable disc-shaped chuck plate characterized in that it comprises:

a plurality of locking means enclosed within the chuck plate which are based radially into the chuck plate to remain within the dimensions of the chuck plate when at rest and which are radially expandable out of the chuck plate by centrifugal force to extend radially beyond the periphery of the chuck plate during rotation;

an annular locking ring for engaging the base of the cell and for extending around the periphery of said chuck plate;

said locking ring having a plurality of recesses for receiving said locking means during rotation.

5,062,827

DEVICE IN ULTRASONIC ASPIRATORS

Hans Wiksell, Täby, Sweden, assignor to Swedemede AB, Uppsala, Sweden

Continuation of Ser. No. 927,185, Nov. 5, 1986, abandoned. This application Feb. 14, 1989, Ser. No. 309,936

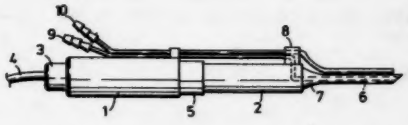
Claims priority, application Sweden, Nov. 8, 1985, 8505289

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] A61B *17/36*

U.S. Cl. 604—22 **7 Claims**

1. In an ultrasonic knife device having a transducer means for converting electrical energy at an ultrasonic frequency to mechanical oscillations, an amplitude transformer means mechanically connected to the transducer means for amplifying the stroke of mechanical oscillation, wherein said amplitude transformer means is an elongated integral unit having a substantially cylindrical portion connected to the transducer neons an intermediate portion adjacent to the cylindrical portion, a tip portion adjacent to the intermediate portion, and a through bore passing through the intermediate portion and the tip portion for aspirating tissue, the improvement wherein the length of the amplitude transformer means is 0.72 times the wavelength of the ultrasonic frequency, and wherein the intermediate portion has geometric form which is the curve of a wave function of the fourth order Fourier form and the tip



portion is conical, whereby the maximum stroke of the longitudinal oscillation mode is at a predetermined resonant frequency, this resonant frequency being separated, in order of magnitude of 20% from the harmonics of the predetermined resonant frequency in the longitudinal oscillation mode, and resonant frequencies of oscillations in the transverse mode.

5,062,828

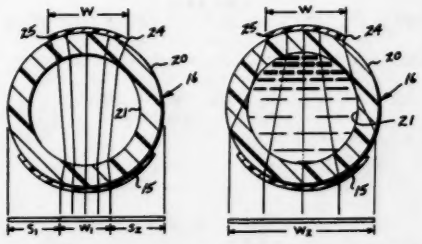
HYPODERMIC SYRINGE

Roger L. Waltz, 1000 W. 4th #4, Grandview, Wash. 98930

Continuation-in-part of Ser. No. 321,999, Mar. 13, 1989, abandoned, which is a continuation of Ser. No. 106, 780, Oct. 8, 1987, abandoned. This application Feb. 6, 1990, Ser. No. 475,702

Int. Cl.[5] A61M *5/315*

U.S. Cl. 604—51 **1 Claim**



1. A method of detecting air bubbles in a hypodermic syringe having a light transmissive tubular body with an internal bore of a prescribed diameter extending between an open end and a reduced end, an elongated plunger with a piston at an end thereof slidably received in the bore, volume calibration indicia along the body, and an elongated strip of a single solid color extending longitudinally along the tubular body independently of the volume calibration indicia and having a chordal width dimension less than the prescribed diameter; comprising the steps of:

drawing a light transmissive liquid into the syringe bore by moving the plunger within the bore from the reduced end toward the open end until the plunger piston aligns visually with a prescribed volume calibration indicia; and

viewing the strip of solid color through the tubular body along the full length thereof between the plunger piston and reduced end to note that the solid strip of color appears to fill substantially the entire bore as a single solid color occupying the entire bore diameter thereby indicating presence of only liquid in the bore between the piston and reduced end of the tubular body, or that a portion of the strip between the piston and reduced end appears substantially narrower than the bore diameter thereby indicating presence of a bubble within the bore.

5,062,829

RELATES TO DEVICES FOR ADMINISTERING A SUBSTANCE SUCH AS A DRUG OR CHEMICAL OR THE LIKE

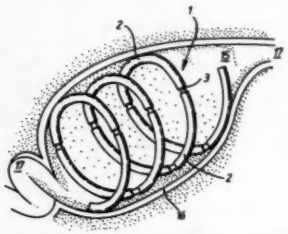
Raymond J. Pryor; James F. Pharoah, and Graham F. Duirs, all of Hamilton, New Zealand, assignors to Carter Holt Harvey Plastic Products Group Limited, Hamilton, New Zealand

Filed Mar. 16, 1990, Ser. No. 495,029

Claims priority, application New Zealand, Mar. 17, 1989, 228382

Int. Cl.[5] A61M *31/00*

U.S. Cl. 604—57 16 Claims



1. A device for insertion into a body cavity of an animal, when in one configuration and to lie against walls of said body cavity in a second expanded configuration, said device comprising a set of interconnected primary elements, and a set of secondary elements forming connectors between said primary elements and connecting said primary elements in the form of a coil, wherein elements of at least one of said sets are constructed of a bio-degradable material.

5,062,830

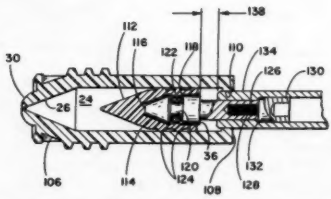
DRY DISPOSABLE NOZZLE ASSEMBLY FOR MEDICAL JET INJECTOR

Kenneth W. Dunlap, Plymouth, Minn., assignor to Derata Corporation, Minneapolis, Minn.

Filed Apr. 4, 1990, Ser. No. 503,948

Int. Cl.[5] A61M *5/30*

U.S. Cl. 604—68 3 Claims



1. A dry disposable nozzle assembly for a hypodermic jet injector of the type including a body containing a power spring operatively coupled to a ram member which is movable at high velocity between a cocked position and a released position, said body further including a plunger assembly disposed within a generally tubular metal sleeve in the path of travel of said ram to be driven thereby where the plunger assembly includes a radial groove, said nozzle assembly including in combination:

(a) a disposable molded plastic nozzle of a generally cylindrical shape adapted to be disposed within and at least partly reinforced on the exterior thereof by said tubular metal sleeve and having first and second ends with an axial bore of circular cross-section extending from said first end toward said second end, said axial bore terminating in a generally conical segment having an apex lying on a longitudinal axis of said axial bore and a counterbore of a predetermined, small diameter relative to said axial bore extending from said second end to said apex and forming a one-piece ejection orifice;

(b) means for removably attaching said molded plastic nozzle to said body within said metal sleeve; and

(c) a disposable seal member encompassed by said molded plastic nozzle and fitted into said axial bore for longitudinal motion therein and including an integrally formed generally conical head dimensioned to fit within said generally conical segment of said axial bore with a predetermined close tolerance, said seal member including a socket formed in said seal member, said socket including a detent adapted to cooperate with said radial groove in said plunger assembly for receiving and releasably locking said plunger assembly.

5,062,831

CATHETER FOR USE IN THE SURGICAL CORRECTION OF A NASOLACRIMAL DUCT OBSTRUCTION

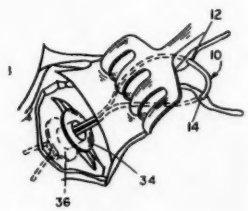
John D. Griffiths, 1738 S. 85th St., Omaha, Nebr. 68124

Continuation-in-part of Ser. No. 250,164, Sep. 28, 1988. This application Apr. 18, 1990, Ser. No. 510,429

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—104 3 Claims



1. In combination,

a flexible tube having its ends extended downwardly, through the puncta, canaliculi, nasolacrimal sac and nasal cavity of a person's nasolacrimal system,

a catheter having upper and lower ends,

the inside diameter of said catheter being such that the free ends of the flexible tube may be extended therethrough,

the length of said catheter being such that said catheter may be extended into the upper end of the nasal cavity with the upper end thereof positioned in the nasolacrimal sac,

said catheter having a flexible, enlarged head portion provided on its upper end for positioning in the nasolacrimal sac;

said catheter having a flexible, enlarged portion provided on its lower end for positioning in the nasal cavity.

5,062,832

ANTICONTAGION DEVICE FOR INJECTING DENTAL ANESTHETIC SOLUTIONS CONTAINED IN CARTRIDGES

Giovanni Seghi, Firenze, Italy, assignor to L. Molteni & C. dei F.lli Alitti S.p.A., Scandicci, Italy

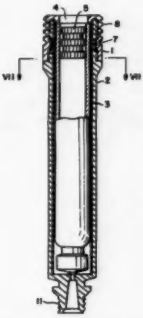
Filed Nov. 7, 1989, Ser. No. 432,859

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 7 Claims

1. An anticontagion device for injecting dental anesthetic solutions, which comprises a cartridge containing anesthetic solution and having a plunger, received therein a piston mechanism for pushing the plunger of the cartridge, a cartridge holding sleeve adapted to receive said cartridge therein and a plug for closing the upper end of said sleeve, means being provided between said sleeve and said plug such that when they are fitted one on the other they cannot be separated, said

plug and said piston mechanism being provided respectively with an external and an internal thread to enable the plug-



sleeve-cartridge assembly to be fitted to said piston mechanism, by engagement of said threads.

5,062,833

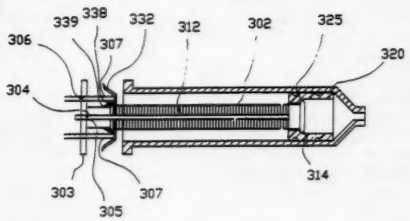
NON-REUSABLE DISPOSABLE SYRINGE AND LOCKING DEVICE

Robert F. Perler, 175 Memorial Hwy., Ste 1-6, New Rochelle, N.Y. 10801

Continuation-in-part of Ser. No. 334,710, Apr. 6, 1989, Pat. No. 4,986,812. This application Oct. 25, 1990, Ser. No. 603,135

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **19 Claims**



1. A non-reusable disposable syringe comprising:

(a) a syringe body having an open end and defining an inside surface;

(b) a plunger adapted to be positioned within said syringe body and to extend from said syringe body, said plunger comprising a plunger shaft and a plunger head at the end of said shaft adapted to be positioned in said syringe body, the shaft end on the other end of said shaft defining spaces for accepting a holding member to be positioned in said syringe body together with said plunger;

(c) a cylindrical piston dimensioned and configured such that said piston bears sealingly against the inside, surface of said syringe body said piston being adapted to be positioned within said syringe body, said piston defining a central passage, a portion of said central passage being smaller than said plunger head, and said central passage being configured and dimensioned to sealingly engage and be closed by said plunger head, said piston being positioned within said syringe body with said plunger passing into said central passage, said piston being adapted to receive said holding member and be urged by said holding member against said plunger head; and

(d) a locking device supported for slidable movement with respect to said plunger, said locking device being capable of movement with respect to said plunger in one direction only and capable of movement with respect to said syringe body in only one direction, said locking device being configured and dimensioned to advance said piston with said plunger after said piston is brought into contact with said locking device.

5,062,834

DEVICE FOR DISPENSING A LIQUID PARTICULARLY USEFUL FOR DELIVERING MEDICAMENTS AT A PREDETERMINED RATE

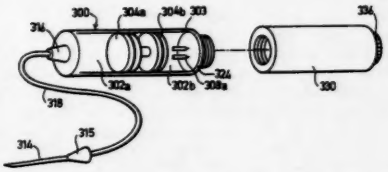
Joseph Gross, Moshav Mazor, and Shlomo Zucker, Yavne, both of Israel, assignors to Product Development (S.G.Z.) Ltd, Petah Tikua, Israel

Filed Aug. 15, 1989, Ser. No. 393,739

Claims priority, application Israel, Feb. 24, 1989, 89400; Jun. 30, 1989, 90816

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—143 **8 Claims**



1. A device for dispensing a liquid at a predetermined rate, comprising a container for receiving a supply of the liquid to be dispenses, and means for subjecting the liquid to a pressurized gas to force liquid from the container; characterized in that said device includes a piston assembly movable within said container and dividing same into a first expansible-contractible chamber for receiving the liquid to be dispenses, and a second expansible-contractible chamber for receiving the pressurized gas to dispense liquid from said first chamber of the container; said piston assembly comprising a pair of pistons spaced apart by a connecting stem; said container being formed with a vent opening in the space between said pistons to provide protection against inadvertent mixing of the gas from the second chamber with the liquid in the first chamber.

5,062,835

ASPIRATOR DEVICE FOR BODY FLUIDS

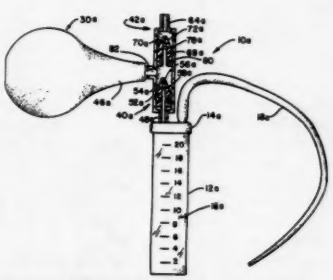
Carlos A. Maitz, 16451 Dapple Gray Ct., Chesterfield, Mo. 63017, and George M. Hauser, 29 Chieftan Dr., St. Louis, Mo. 63146

Continuation of Ser. No. 144,375, Jan. 15, 1988, Pat. No. 4,921,488. This application Dec. 1, 1989, Ser. No. 444,316

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—153 **3 Claims**



1. A meconium aspirator device for removing body fluids

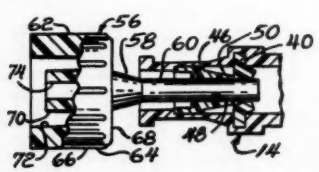
comprising a fluid collector having an air-tight chamber for receiving body fluids, an elongated flexible tube securely connected to said collector and including a first sealed passageway communicating with said air-tight chamber, said elongated flexible tube having a free end adapted to be inserted into a body cavity for fluid communication with body fluids, a squeeze bulb securely connected to said collector and associated with a second sealed passageway communicating with the air-tight chamber of said collector, said squeeze bulb being operatively associated with first and second one-way valve means which open in the same direction, said first and second valve means comprising normally closed valve means which open and close in response to squeezing and expansion of said squeeze bulb, said first one-way valve means being operatively connected relative to said second sealed passageway to permit air to be withdrawn in one direction through the first sealed passageway, air-tight chamber and second sealed passageway upon compression and release of said squeeze bulb for establishing a vacuum through said passageways to remove body fluids for deposit of liquid content in said collector, said second one-way valve means being operatively connected to said squeeze bulb to allow gas and vapor to be expelled therethrough to atmosphere, and said squeeze bulb being operatively associated relative to the other components of said aspirator device to facilitate one-handed gripping, lifting and operation of said aspirator device by said squeeze bulb alone.

5,062,836

PLACEMENT DEVICE FOR A CATHETER AND GUIDE WIRE

Amy M. Wendell, Franklin, Mass., assignor to The Kendall Company, Mansfield, Mass.

Filed Mar. 14, 1990, Ser. No. 493,569
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—167 **6 Claims**



1. In a placement device for a catheter wherein the catheter is introduced into a patient with the aid of a guide wire, the placement device including a valve assembly having a proximal end for connection to a syringe after the guidewire is removed from the patient, a distal end for connection to the proximal end of the catheter, and an elastic valve member having at least one slit and a slide member being slidably received in the valve assembly and moveable between a first position spaced from the valve member with the valve member being closed, and a second position engaged against the valve member with the valve member being open, with the slide member having a bore extending therethrough;

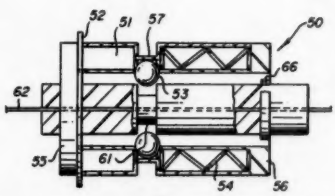
the improvement comprising a valve opener for opening the valve to permit removal of the guidewire therethrough after introducing the catheter into the patient, the valve opener having opposed distal and proximal ends, a channel extending between the opposed ends and having an inner diameter sufficiently large to receive the guide wire at the distal end of the valve opener and to permit passage of the guide wire through the opener and then out the proximal end thereof, the valve opener having an elongated stem at its distal end, the stem having an outer diameter sufficiently small to be releasably received in the bore of the slide member, the stem having a sufficient length to extend through the slide member to open the valve member whereby to permit removal of the guide wire through the opened valve member, the proximal end of the valve opener having means for releasably securing the valve opener on the proximal end of the valve assembly prior to use in placing the catheter in the patient.

5,062,837

IV NEEDLE HOLDER

Habib Al-Sioufi, P.O. Box 654, Brookline, Mass. 02146, and Antoine J. Koudsi, 52 Blueberry Circle, Pelham, N.H. 03076

Division of Ser. No. 186,432, Apr. 26, 1988, Pat. No. 4,942,881.
This application May 24, 1990, Ser. No. 528,082
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—240 **4 Claims**



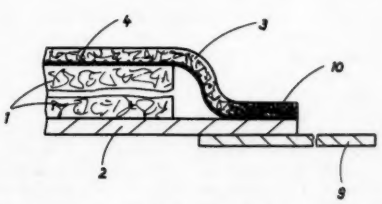
1. A blood collection needle holder comprising an elongated tube open at one end for receiving therein and holding a blood collection container, and locking means for releasable holding a blood collection needle in communication with said collection container disposed at the other end of said elongated tube, said locking means comprising a tubular receiver means for engaging said other end of the elongated tube and holding and retaining said blood collection needle in communication therewith, a sliding sleeve concentrically disposed around said receiver means and longitudinally displaceable with respect thereto, sufficient annular space being provided between said receiver means and sleeve to accommodate at least one laterally displaceable stop means disposed therein for engaging indentations provided in a collar fixedly attached to the portion of said blood collection needle to be disposed within said receiver, said sleeve being further provided with means for engaging and laterally displacing said stop means partially into said indentations when said sleeve is displaced longitudinally in a closed position with respect to said receiver means to thereby engage and hold said needle within said means and to release said needle when said sleeve is retracted.

5,062,838

ABSORBENT DISPOSEABLE ARTICLE

Krzysztof Nalowaniec, and Kurt Simmler, both of Heidenheim, Fed. Rep. of Germany, assignors to Paul Hartmann Aktiengesellschaft, Heidenheim, Fed. Rep. of Germany

Filed Apr. 15, 1987, Ser. No. 38,546
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3613042
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—366 **8 Claims**



1. An absorbent disposable article for absorbing and retaining moisture, such as, for example, a diaper, and of the type including an absorbent body means having first and second sides and a boundary edge region, liquid impermeable protective sheet means operably arranged along said first side of said

absorbent body means, porous cover layer means operably arranged along said second side of said absorbent body means, and further of the type wherein said liquid impermeable protective sheet means and said porous cover layer means extend beyond at least a portion of said boundary edge region of said absorbent body means and are there bonded together, said absorbent disposable article comprising:

a liquid barrier layer means being arranged along at least a portion of said boundary edge region, interposed between said porous cover layer means and said absorbent body means and likewise interposed between said porous cover layer means and said liquid impermeable protective sheet means,

said liquid barrier layer means being continuously physically bonded to and extending into said porous cover layer means without penetrating completely through said porous cover layer means,

said liquid barrier layer means being fabricated of a heat sealable thermoplastic material in the form of a prefabricated impervious sheet.

5,062,839

DISPOSABLE TRAINING PANTY WITH CONTROLLED WETNESS RELEASE

Dora Anderson, 28 Metamora Crescent, London, Ontario, Canada N6G 1R3

Filed Mar. 21, 1990, Ser. No. 497,129
Claims priority, application Canada, Sep. 29, 1989, 614631
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—385.1 **7 Claims**

1. A disposable training panty adapted to release wetness to a controlled extent, comprising:

(a) an outer liquid permeable covering including a front portion and a back portion, said front and back portions being contiguous along a crotch area,

(b) an inner absorbent portion secured to said outer covering which does not fully absorb a child's wetness so that in the event the child has a bowel or bladder accident in said panty said panty releases through said permeable covering to said controlled extent unabsorbed wetness,

(c) means for joining the sides of said front and back portions to form side seam, said joining means being releasable to permit ready opening of said seams in the event the child has a bowel or bladder accident in said panty,

(d) means for securing said panty to a child's waist, and

(e) means for defining leg openings through which a child's legs will extend once said panty is secured to a child.

5,062,840

DISPOSABLE DIAPERS

John N. Holt, and Debra S. Holt, both of Box 4, Ralston, Okla. 74650

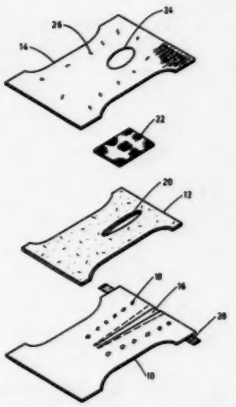
Filed May 22, 1989, Ser. No. 355,654
Int. Cl.[5] A41B *13/02*
U.S. Cl. 604—385.1 **13 Claims**

1. A disposable diaper comprising:

a water permeable inner layer having an opening therein shaped to surround a wearer's anal opening;

a water retention absorbent intermediate layer having a void positioned at least partially under said opening of said inner layer for receiving solid waste excretement from a wearer;

a water impervious outer layer adjacent said intermediate layer;



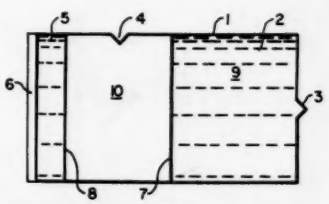
means to hold said inner layer, said intermediate layer and said outer layer in position.

5,062,841

IMPLANTABLE, SELF-REGULATING MECHANOCHEMICAL INSULIN PUMP

Ronald A. Siegel, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 231,817, Aug. 12, 1988, abandoned. This application Nov. 14, 1989, Ser. No. 434,623
Int. Cl.[5] A61K *9/22*
U.S. Cl. 604—891.1 **44 Claims**



1. An implantable pump for the delivery of insulin to a mammal in need thereof, said pump comprising a housing which supports within its walls:

(a) an aqueous-swellable member which initiates an insulin pumping cycle by swelling in response to an increase in blood glucose level and terminates an insulin pumping cycle by deswelling in response to a decrease in blood glucose level, said member being exposed to the body fluids which surround the pump when implanted in a mammal;

(b) a first chamber containing a pharmaceutically acceptable insulin composition and including a valve means which permits the outflow of the insulin composition; and

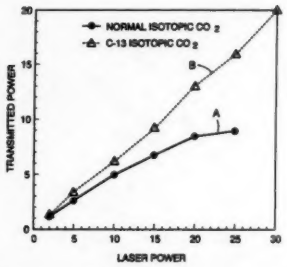
(c) means coupled with said first chamber for causing insulin to be expelled from the first chamber in response to swelling of the aqueous-swellable member.

5,062,842

ISOTOPIC CO_2 LASER AND METHOD OF USE FOR MEDICAL TREATMENT

William B. Tiffany, Palo Alto, Calif., assignor to Coherent, Inc., Palo Alto, Calif.

Filed Dec. 21, 1989, Ser. No. 454,139
Int. Cl.[5] A61N 5/06
U.S. Cl. 606—3 12 Claims



1. An improved medical treatment laser system including a gas laser for generating a beam of laser energy, a means for delivering the beam of laser energy to the medical treatment site, and a means for purging the delivering means using a purge gas, with the improvement comprising:

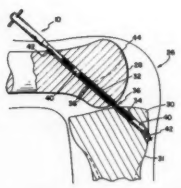
a gaseous lasing medium in the gas laser defined primarily by an isotope different from the isotope of the purge gas.

5,062,843

INTERFERENCE FIXATION SCREW WITH INTEGRAL INSTRUMENTATION

Thomas H. Mahony, III, 1730 Wood Ave., Colorado Springs, Colo. 80903

Filed Feb. 7, 1990, Ser. No. 476,252
Int. Cl.[5] A61F 2/08
U.S. Cl. 606—53 10 Claims



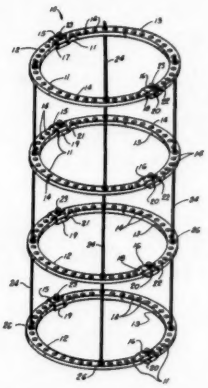
1. A fixation screw for securing a bone graft of a ligament replacement graft in place in a ligament tunnel in a bone by tightening between the bone graft and the bone surrounding the ligament tunnel to force the bone graft against the bone surrounding the ligament tunnel, comprising a body having a threaded end formed as an interference screw from material which is soft compared to bone so that threads of the threaded end do not cut into the bone graft and bone surrounding the ligament tunnel when the fixation screw is tightened, the fixation screw further including integral instrumentation means fabricated as one piece with the threaded end of the body, and of the same material formed as an integral part of the fixation screw for tightening the fixation screw without the need for use of instrumentation separate from the fixation screw, the body having a portion extended outwardly from an entrance to the ligament tunnel after fixation screw is tightened in place wherein said outwardly extending portion can be trimmed off.

5,062,844

METHOD AND APPARATUS FOR THE FIXATION OF BONE FRACTURES, LIMB LENGTHENING AND THE CORRECTION OF DEFORMITIES

Russell D. Jamison, Germantown, Tenn.; David Brumfield, Nesbit, Miss., and Richard Treharne, Memphis, Tenn., Paul Wisnewski, Memphis, Tenn., Robert Wigginton, Collierville, Tenn., Michael Sherman, Memphis, Tenn., assignors to Smith & Nephew Richards Inc., Memphis, Tenn.

Filed Sep. 7, 1990, Ser. No. 579,329
Int. Cl.[5] A61F 5/04
U.S. Cl. 606—54 25 Claims



1. A bone fixator apparatus for fixation of fractures, limb lengthening, and the correction of bone deformities comprising:

(a) a plurality of half rings, each having inner and outer annular curved surfaces, and spaced parallel, flat upper and lower surfaces, each half ring being made of a plastic-carbon composite material, the half rings being selectively connectable to form pairs that define multiple rings upon assembly such as by bolting, each ring defining a plane;

(b) the plastic-carbon composite half rings including one or more carbon fiber braid members oriented generally parallel to the plane of the half ring;

(c) a plurality of holes spaced along the half rings;

(d) circumferential reinforcement means positioned adjacent the holes for strengthening the half ring adjacent the holes; and

(e) a plurality of tie rods assemblies including rod members extending during use between half rings and through at least some of the holes in the half rings, and fasteners for securing each half ring to one or more tie rods, for maintaining spacing between the half rings during use.

5,062,845

METHOD OF MAKING AN INTERVERTEBRAL REAMER

Stephen D. Kuslich, Maplewood, and James D. Corin, Minneapolis, both of Minn., assignors to Spine-Tech, Inc., Minneapolis, Minn.

Filed May 10, 1989, Ser. No. 350,050
Int. Cl.[5] A61B 17/56
U.S. Cl. 606—80 12 Claims

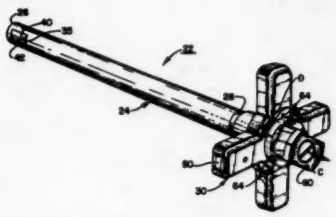
1. A method of making a surgical tool for use in spinal stabilization in a mammal spine where said spine has contiguous vertebra, each including a body portion, said body portions being of generally predetermined dimension and spaced apart by a layer of tissue of generally predetermined dimension, said method comprising:

providing a tool body having an operator engaging end and a distal end;

sizing said distal end to have external dimensions selected for

said distal end to be inserted within an animal body and located against said layer;

providing cutting means on said distal end for cutting at least a portion of said layer and at least a portion of said body portions to form a chamber within said contiguous vertebra and layer, and with said chamber sized greater than said external dimension; and



providing control means for controlling a depth of cut of said cutting means between at least a first position with said cutting means retained within said external dimensions and at least a second position with said cutting means extended to form said chamber.

5,062,846

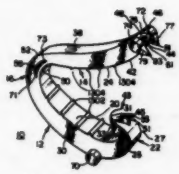
PENETRATING PLASTIC LIGATING CLIP

Seik Oh, and Ray McKinney, Jr., both of Raleigh, N.C., assignors to Edward Weck Incorporated, Princeton, N.J.

Continuation-in-part of Ser. No. 329,453, Mar. 28, 1989, abandoned. This application Oct. 17, 1989, Ser. No. 422,464

Int. Cl.[5] A61B *17/12*

U.S. Cl. 606—158 **13 Claims**



1. A polymeric surgical clip comprising first and second leg members joined at their proximal ends by a resilient hinge means, each leg member having a vessel clamping inner surface and an opposite outer surface, said vessel clamping inner surface being in opposition to the vessel clamping inner surface of the other leg member, said first leg member terminating at its distal end in a deflectible hook member curved toward said second leg member, said second leg member terminating at its distal end in a locking portion complementary to said hook member whereby when said first and second leg members are moved from an open position to a closed position about said hinge means, the hook member deflects about the distal end of said second leg member to lock the clip in a closed position, said hook member having a continuously curved outer surface extending distally from said outer surface of said first leg member, side surfaces and an inner surface; said hook member further comprising a distal tip portion terminating in a sharp pointed distal tip extending rearwardly toward the proximal end of said first leg, the distal end of said second leg member including a groove through which said distal tip passes when said first and second leg members are moved from an open position to a closed position, whereby connective tissue adjacent the vessel to be clamped is cut or stretched, which aids in locking the first and second leg members when said legs are closed.

5,062,847

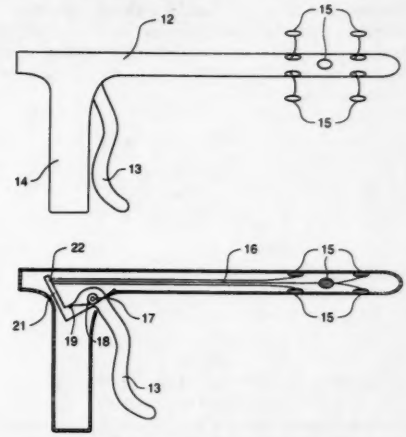
LAPAROSCOPIC RETRACTOR

William E. Barnes, P.O. Box 126, Salem, Ky. 42078

Filed Dec. 31, 1990, Ser. No. 636,482

Int. Cl.[5] A61L *17/11*

U.S. Cl. 606—194 **4 Claims**



1. A surgical retractor comprising

a barrel having a distal end and handle located opposite the distal end of said barrel,

a plurality of retractor pods located at a plurality of angles and positions on the lateral periphery of the barrel,

the retractor pods being movable between a retracted position in which the pods are substantially flush with the surface of the barrel and an extended position in which each pod is outwardly and laterally projected from the barrel.

the handle being operatively connected to the pods to move the pods between the retracted and extended positions, wherein the handle comprises a trigger and a grasping member, the trigger being pivotable with respect to the grasping member, and further comprising

flexible, resilient fibers positioned substantially within the barrel having opposite ends connected to the trigger at one end and to a retractor pod at the opposite end.

5,062,848

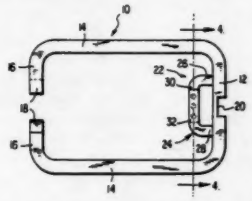
HEMOSTATIC CLIP AND APPLICATOR THEREFOR

John G. Frazee, 17357 Magnolia, Encino, Calif. 91316, and Roger J. Malcolm, 920-C Calle Negocio, San Clemente, Calif. 92672

Division of Ser. No. 489,900, Mar. 7, 1990, Pat. No. 5,032,127. This application Mar. 26, 1991, Ser. No. 680,107

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—213 **12 Claims**



1. A hemostatic clip comprising:

a single-piece molded plastic member of generally C-shaped configuration having a pair of arms; a jaw at the first end of each arm, said jaws extending toward one another and having mating facing edges; a mid-portion connecting the other ends of said arms, said mid-portion having a centrally located transverse region of reduced thickness extending thereacross and forming a hinge about which said arms and jaws pivot; and first and second cooperating latching members, said members having base portions extending from said mid-portion on opposite sides of said region, respectively, and head portions extending in overlapping relation to one another and provided with a series of interengaging means.

5,062,849

JOINT FOR COUPLING TWO ELONGATED PROSTHESIS SECTIONS

Klaus-Dieter Schelhas, Bremen, Fed. Rep. of Germany, assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Mar. 20, 1990, Ser. No. 496,359

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1989, 3909182

Int. Cl.[5] A61F *2/28*

U.S. Cl. 623—16 **4 Claims**

1. Apparatus adapted to provide a self-locking, non-rotating joint for coupling two rod-shaped prosthesis sections using a hollow clamping sleeve, the apparatus comprising:

two prosthesis sections, each section having an unthreaded free end and external threads adjacent the free end, each free end being substantially cylindrical and having a sloping contact surface;

a hollow clamping sleeve with an interior diameter slightly larger than the outer diameter of the free ends, the clamping sleeve having counter-rotating internal threads adapted to cooperate with the external threads of the prosthesis sections, such that the sloping contact surfaces of the prosthesis sections slide on one another when the clamping sleeve is tightened, forcing said free ends transversely against the interior surface of said clamping sleeve; whereby the prosthesis sections are joined in non-rotatable, self-locking manner.

5,062,850

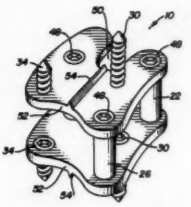
AXIALLY-FIXED VERTEBRAL BODY PROSTHESIS AND METHOD OF FIXATION

Michael MacMillan, Gainesville, Fla., and Regis Haid, Jr., San Antonio, Tex., assignors to University of Florida, Gainesville, Fla.

Filed Jan. 16, 1990, Ser. No. 465,419

Int. Cl.[5] A61F *2/44*

U.S. Cl. 623—17 **15 Claims**



1. A vertebral body prosthetic device for replacing a surgically removed natural vertebral body, comprising:

a. an upper endplate and a lower endplate, each endplate having a height, length and width to completely fit within a spinal column defect created when a vertebral body is surgically removed, and each endplate being provided with at least a first and a second hole extending through the height of the endplate;

b. a plurality of support columns separating the endplates, each support column connecting to the lower surface of the upper endplate and the upper surface of the lower endplate;

c. at least two fixation screws, one fixation screw being insertable into the first hole in the upper endplate and the other fixation screw being insertable into the first hole of the lower endplate, whereby when the device is inserted into a spinal column and the fixation screws are inserted into the first holes, the fixation screws are positioned approximately parallel to the axis of the spinal column; and

d. at least two anti-rotation screws, one anti-rotation screw being insertable into the second hole in the upper endplate and the other anti-rotation screw being insertable into the second hole of the lower endplate, whereby when the device is inserted into a spinal column and the anti-rotation screws are inserted into the second holes, the anti-rotation screws are positioned approximately parallel to the axis of the spinal column.

5,062,851

ANCHORING ELEMENT FOR SUPPORTING A JOINT MECHANISM OF A FINGER OR OTHER RECONSTRUCTED JOINT

Per-Ingvar Branemark, Mölndal, Sweden, assignor to Medevelop AB, Sweden

Filed Sep. 13, 1989, Ser. No. 406,586

Claims priority, application Sweden, Apr. 25, 1989, 8901508

Int. Cl.[5] A61F *2/30*

U.S. Cl. 623—18 **12 Claims**

1. An anchoring element for supporting a joint mechanism, wherein said anchoring element is substantially rotationally symmetrical, at least partially hollow, and includes a material which is compatible with the tissue of a bone, said anchoring

element having a surface which can be at least partially osseointegrated with the tissue to achieve permanent endosteal anchorage in the longitudinal axis of the bone; and

wherein said anchoring element comprises a sleeve-like body with a radially outer surface with external threads for screwing said anchoring element in to the bone; and

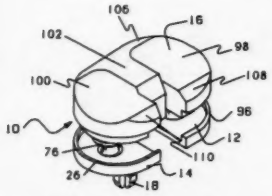
wherein said sleeve-like body is deformable so as to reduce the risk of concentrated stress and so as to provide said anchoring element with an ability to adjust to the tissue.

5,062,852

TIBIAL PROSTHESIS WITH INDEPENDENT MEDIAL AND LATERAL BASEPLATES

Lawrence D. Dorr, La Canada, Calif.; Brian D. Burkinshaw, Pflugerville, and Joseph S. Skraba, Austin, both of Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.

Filed Feb. 9, 1990, Ser. No. 477,745
Int. Cl.[5] A61F *2/38*
U.S. Cl. 623—20 **49 Claims**



1. A tibial prosthesis comprising

a separate medial baseplate adapted to be affixed to a medial surface at a head of a patient's tibia, said medial baseplate having a bottom side and a top side;

means on said bottom side of said medial baseplate for independently securing said baseplate to said tibia;

a separate lateral baseplate adapted to be affixed to a lateral surface at the head of the tibia, said lateral baseplate having a bottom side and a top side;

means on said bottom side of said lateral baseplate for independently securing said baseplate to said tibia; and

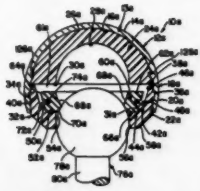
an upper part having medial and lateral articulating surfaces and connected to both the medial baseplate and the lateral baseplate, respectively, at the top sides thereof.

5,062,853

BIPOLAR FEMORAL IMPLANT

Mark R. Forte, 11 Oak La., Pine Brook, N.J. 07058

Filed Aug. 8, 1989, Ser. No. 391,117
Int. Cl.[5] A61F *2/34*
U.S. Cl. 623—22 **39 Claims**



1. An implantable prosthetic joint comprising:

a) first bone securing means for constraining the prosthetic joint within a first bone of a biological joint, said first bone securing means including a spherical shell articulating within a socket in the first bone, said shell including an inner spherical surface and an open circumferential end;

b) second bone securing means for securing the prosthetic joint to a second bone of the biological joint, said second bone securing means including a femoral head and stem means connected with said femoral head for securing the prosthetic joint to the second bone;

c) bearing means for connecting said second bone securing means with said first bone securing means, said bearing means including:

i) an outer spherical dome which engages with the inner spherical surface of said shell,

ii) an open circumferential end,

iii) an inner spherical surface which receives said femoral head for ball-and-socket movement therein, and

iv) an inner annular surface at said open circumferential end, said inner annular surface including at least one annular step;

d) split spring ring means for retaining said femoral head in said bearing means, said split spring ring means including an annular inner engaging surface biased into engagement with the femoral head when the femoral head is seated in said bearing means, and said split spring ring means engaged with said at least one annular step of said inner annular surface when said femoral head is fit within said bearing means; and

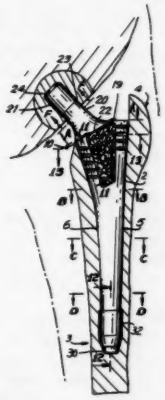
e) said bearing means including a bearing insert having said outer spherical dome and said inner spherical surface, and an insert rim formed separate from and independent of said bearing insert, said insert rim being secured to said first bone securing means and having said open circumferential end, said inner annular surface, with an annular recess defined between said bearing insert and said insert rim for receiving said split spring ring means.

5,062,854

PROSTHETIC DEVICE AND METHOD OF IMPLANTATION

Philip C. Noble, Houston, Tex., and Mary B. Padgett, Parsippany, N.J., assignors to Pfizer Hospital Products Group, New York, N.Y.

Division of Ser. No. 255,206, Oct. 7, 1988, Pat. No. 5,002,560. This application Jul. 24, 1990, Ser. No. 557,272
Int. Cl.[5] A61F *2/34*
U.S. Cl. 623—23 **7 Claims**



1. A method comprising preparing an intramedullary canal of a femur for placement of a bone prosthesis therein, said bone prosthesis having a predetermined shape in its proximal portion, wherein the intramedullary canal is prepared in its proximal portion so that the inner wall of the entire lateral side possesses a substantial surface layer of cancellous bone and provides an interference press-fit with the lateral side of the proximal portion of said bone prosthesis and the inner wall of the entire media side possesses a surface layer substantially

comprised of cortical bone and provides a substantially line-to-line fit with the medial side of the proximal portion of said bone prosthesis and a portion of the inner wall of each of the anterior and posterior sides possesses a substantial surface layer of cancellous bone and provides an interference press-fit with the corresponding proximal portion of said bone prosthesis and a portion of the inner wall of each of the anterior and posterior sides possesses a surface layer substantially comprised of cortical bone and provides a substantially line-to-line fit with the corresponding proximal portion of said bone prosthesis.

5,062,855

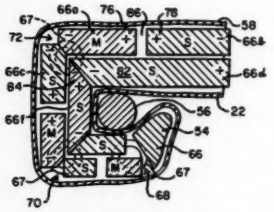
ARTIFICAL LIMB WITH MOVEMENT CONTROLLED BY REVERSING ELECTROMAGNET POLARITY

Richard G. Rincoe, 49 S. Holman Way, Golden, Colo. 80401

Continuation-in-part of Ser. No. 102,162, Sep. 28, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 262,287

Int. Cl.[5] A61F *2/54, 2/70*

U.S. Cl. 623—24 **10 Claims**



1. A robotic or prosthetic limb such as a hand, arm, foot, or leg, or a portion of such a limb which can be moved to function in a substantially anatomical manner, said limb comprising inn combination:

an outer skin;

at least two magnets including at least one electromagnet, each said magnet having a first end and a second end, each said first end of each magnet carrying or capable of carrying a first magnetic polarity and each said second end of each magnet carrying or capable of carrying a second magnetic polarity, each said magnet being linearly aligned in a manner such that one pole end of each magnet is adjacent to only one pole end of each next adjacent magnet, said magnets being disposed inside said outer skin in a first position, each said electromagnet being located and positioned within said skin inn a manner such that when it is activated its magnetic field will affect each adjacent magnet;

means for pivotally attaching at least one pole end of one said electromagnet to only one pole end of an adjacent magnet by a hinge, said hinge being disposed in a joint area of the limb, wherein at least one said magnet is moveable;

an electrical power source connected to each said electromagnet; and

means for activating or switching the polarity of at least one said electromagnet, whereby the activating or switching of the polarity of said electromagnet causes either the switched electromagnet or one of said magnets which is adjacent to said switched electromagnet to move from a first position to a second position to thereby cause controllable movement of said limb or a portion of said limb.

5,062,856

TEACHING PLAYBACK SWING-PHASE-CONTROLLED ABOVE-KNEE PROSTHESIS

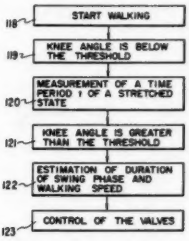
Seishi Sawamura, Kobe; Sakuya Nakajima, Nishinomiya; Kunio Amemori, Kobe; Hidehisa Oku, Akashi; Akio Nakagawa, Itami; Ichiro Kitayama, Kobe; Hiromu Matsuda, Akashi; Katsuhiko Yoshida, Takasago; Masaru Takeda, Kobe; Toshio Nakane, Akashi; Shiro Horiguchi, Hyogo, and Shigeru Yuki, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko SHO, Kobe, Japan

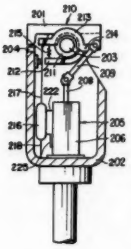
Filed Mar. 23, 1989, Ser. No. 327,894

Claims priority, application Japan, Mar. 25, 1988, 63-72943; Mar. 25, 1988, 63-72944; Mar. 25, 1988, 63-72945

Int. Cl.[5] A61F *2/64, 2/70, 2/74*

U.S. Cl. 623—24 **2 Claims**





1. A teaching playback swing-phase-controlled above-knee prosthesis comprising:

a thigh frame;

a leg frame pivotally joined to the thigh frame via at least one knee joint pin,

a cylinder interconnecting the thigh and leg frames, said cylinder being provided with upper and lower chambers, an air valve and means for adjusting the degree of opening of the air valve of the cylinder to a plurality of values for a plurality of walking speeds which may be selected during trial walking in a teaching mode of operation;

mode selecting means having a plurality of positions including positions which may be selected in the teaching mode for setting degrees of opening of the air valve of the cylinder for the plurality of walking speeds and a position to be selected for a playback mode;

opening detecting means for detecting a degree of opening of the air valve of the cylinder during the teaching mode;

opening storage means for storing a plurality of degrees of opening of the air valve of the cylinder set respectively for the plurality of walking speeds in the teaching mode;

phase detecting means for detecting swing phases and stance phases of walking int h teaching mode and the playback mode and comprising a detector capable of detecting an angle between said leg and thigh frames;

walking speed determining means for determining an actual walking speed during the playback mode on the basis of the lengths of said swing phases and stance phases detected by the phase detecting means;

control means for adjusting the degree of opening of the air valve of the cylinder during the playback mode to one of said values of opening corresponding to the actual walking speed determined by the walking speed determining means; and

a braking device for braking a drop-off of said leg frame, said braking device comprising:

a brake disk and a movable brake shoe respectively mounted to alternate ones of said thigh and leg frames;

resilient means for biasing the brake shoe away from the brake disk;

a pneumatic actuator having a hermetic chamber and operatively connected to the brake shoe;

an air passage connecting the upper chamber of said air cylinder to the hermetic chamber of the pneumatic actuator and provided with a check valve;

an air passage connecting the hermetic chamber of the pneumatic actuator to the lower chamber of said air cylinder and provided with a check valve and a metering valve; and

an air passage connecting upper and lower chambers of said air cylinder and provided with a check valve and a metering valve.

5,062,857

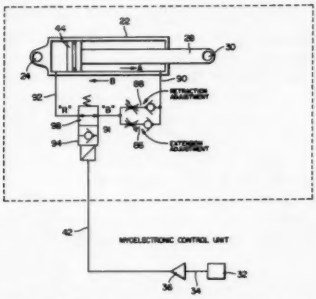
MYOELECTRICALLY CONTROLLED KNEE JOINT LOCKING DEVICE

William A. Berringer, Quakertown, and Edward J. Sulima, Jr., Ambler, both of Pa., assignors to Advanced Prosthestetics Development Corporation, Quakertown, Pa.

Filed Jun. 5, 1990, Ser. No. 533,430

Int. Cl.[5] A61F *2/64, 2/72*

U.S. Cl. 623—25 **6 Claims**



1. A myoelectrically controlled knee joint locking device, said device comprising:

an upper artificial limb,

a lower artificial limb pivotably mounted on said upper artificial limb for free-swinging extension and retraction of said lower artificial limb with respect to said upper artificial limb,

a hydraulic piston cylinder assembly, a piston rod of said assembly being pivotably mounted on said upper artificial limb, a cylinder of said assembly being pivotably mounted on said lower artificial limb,

a piston mounted on said piston rod being slidably mounted in said cylinder,

hydraulic fluid being in sealed communication with opposite sides of said piston for movement of said piston in two opposite directions and transfer of said fluid to opposite sides of said piston,

retraction adjustment means for regulating flow of said hydraulic fluid and therefore the speed of retraction of said lower artificial limb when said piston is moved in one of the two opposite directions by movement of said lower artificial limb with respect to said upper artificial limb,

extension adjustment means for regulating flow of said hydraulic fluid therefore the speed of extension of said lower artificial limb when said piston is moved in the other of the two opposite directions by movement of said lower artificial limb with respect to said upper artificial limb,

a single sensing means mounted on a single muscle of the user for generating a single signal in response to a detected myoelectric potential generated voluntarily or involuntarily by the muscle of the user in response to a desired instantaneous locking of said hydraulic piston cylinder assembly against retraction of said lower artificial limb, and

control means responsive to said signal for controlling said assembly to permit only extension of said artificial limb with respect to said upper artificial limb and to instantaneously lock said assembly against retraction of said lower artificial limb at any point along a path of travel of said piston rod.

5,062,858

CONNECTING DEVICE FOR TWO MEMBERS OF AN ARTIFICIAL JOINT

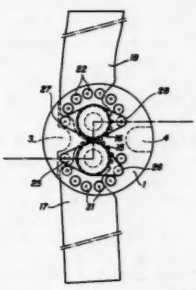
Vanden Broeck, 14b route du Curson, CH 1197 Prangins, and Olivier De Marchi, Ecole de Duillier, CH 1266 Duillier, both of Switzerland

Filed May 30, 1990, Ser. No. 530,312

Claims priority, application Switzerland, May 30, 1989, 2023/89

Int. Cl.[5] A61F *2/64*

U.S. Cl. 623—43 **4 Claims**



1. A joint device for connecting first and second members of an artificial joint, the first and second members being provided to affix the artificial joint to the human body, the joint device comprising:

first and second supporting side plates disposed in parallel and fixedly coupled to one another;

first and second pivot pins extending between said first and second side plates;

first and second semi-circular toothed sectors, one mounted coaxially to each pivot pin, said toothed sectors being in engagement with one another and each being fixedly associated with one of said first and second members; and

adjustable stop means extending into the path of at least one of said first and second members to define a sector of freedom for said at least one member, at least one of said side plates comprising positioning openings angularly distributed about the axis of at least one of said pivot pins and two angular stops which are angularly adjustable relative to the axis of said at least one pivot pin, each of said stops comprising a rod extending through a positioning opening of said at least one side plate, said rod being integral with a small plate which has a plane perpendicular to a longitudinal axis of said rod, said small plate including means for connecting said small plate to the axis of said at least one pivot pin.

5,062,859

PROSTHETIC FOOT HAVING Z SHAPED INSERT

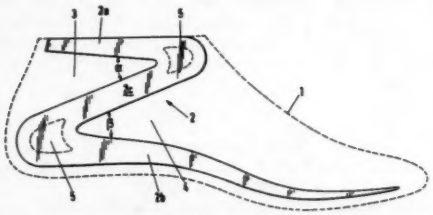
Max Naeder, Duderstadt, Fed. Rep. of Germany, assignor to Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-Kommanditgesellschaft, Duderstadt, Fed. Rep. of Germany

Filed Jun. 11, 1990, Ser. No. 536,099

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1989, 3918810

Int. Cl.[5] A61F *2/66*

U.S. Cl. 623—55 18 Claims



1. A prosthetic foot having a front part including a toe section, a longitudinal part rearward of said front part, a top edge for non-articulate connection of said prosthetic foot to an artificial leg and a resilient foot insert located inside said prosthetic foot for receiving and transmitting stresses, said resilient foot insert comprising:

a top horizontal section forming said top edge;

a bottom horizontal section of more extended length than said top section having a free end extending into said toe section of said prosthetic foot for providing a high degree of elasticity for said front part of said prosthetic foot and a high degree of energy storage capacity when said front part of said prosthetic foot is stressed; and

an oblique Z-bar section joining said top section and said bottom section in said longitudinal part of said foot to form an approximately Z-shaped construction;

said top section and said bottom section, respectively with said oblique section, enclosing a top angle forming a top rear wedge-shaped cavity and enclosing a bottom angle forming a bottom front wedge-shaped cavity;

said top section, said bottom section, and said oblique section together enabling at least one of plantar flection, dorsal flection, and axial compression for said prosthetic foot;

said plantar flection occurring as said top angle is reduced in a plane perpendicular to a pelvis of a wearer and parallel to a direction of walking;

said dorsal flection occurring as said bottom angle is reduced;

said axial compression occurring as both said top angle and said bottom angle are reduced by deformation and movement perpendicular to a plane of said perpendicular foot.

5,062,860

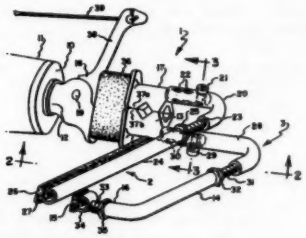
PROSTHETIC ATTACHMENT

Frank A. Cantafio, Jr., 500 Center Rd., W. Seneca, N.Y. 14224

Filed Feb. 6, 1990, Ser. No. 475,854

Int. Cl.[5] A61F *2/58*

U.S. Cl. 623—63 11 Claims



1. A prosthetic attachment for an upper limb to assist an amputee playing a stringed instrument which comprises, a chord finger, a portion of said chord finger extending in a direction generally normal to the remainder of said chord finger, a part of said portion being adapted to extend across an instrument neck having strings extending therealong, means to adjust the spacing between said part and the remainder of said finger, a note finger spaced from said chord finger, a portion of said note finger extending in a direction generally normal to the remainder of said note finger, and a piece of said note finger portion being adapted to engage a single string, means to adjust the spacing between said piece and the remainder of said note finger, and means to vary the spacing between said chord finger and said note finger, whereby a chord selected by engaging said chord finger with strings of an instrument can be selectively modified by engaging said note finger with a chosen one of the strings engaged by said chord finger.

5,062,861

NOVEL NAVY AND BLACK DISPERSE DYE MIXTURES INCLUDING AMINO-PHENYL THIOPHENE AZO DISPERSE DYE AND RED, YELLOW OR ORANGE DISPERSE DYES

Erwin Hahn, Heidelberg; Guenter Hansen, Ludwigshafen; Karl-Heinz Etzbach, Frankenthal; Helmut Reichelt, Neustadt; Ernst Schefczik, Ludwigshafen; Helmut Degen, Frankenthal; Reinhold Krallmann, Weisenheim, and Gerhard Wagenblast, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 23, 1990, Ser. No. 497,672

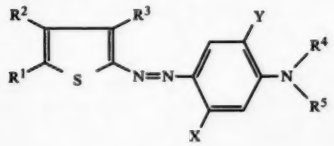
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, 3911949

The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.

Int. Cl.[5] **C09B** *29/03, 67/22;* **D06P** *1/18, 3/52*

U.S. Cl. 8—639 **3 Claims**

1. A navy or black dye mixture containing one or more thiopheneaxo dyes of the formula:



where

R^1 is formyl, cyano or phenylsulfonyl,

R^2 is halogen, C_1–C_8-alkoxy, substituted or unsubstituted phenoxy, C_1–C_6-alkylthio, phenylthio, C_1–C_4-alkylsulfonyl or phenylsulfonyl,

R^3 is cyano, C_1–C_6-alkoxycarbonyl, whose alkyl chain may be interrupted by one or more oxygen atoms, carbamoyl or C_1–C_4-monoalkyl- or dialkyl-carbamoyl,

R^4 is C_1–C_6-alkyl which may be substituted by hydroxyl, C_1–C_4-alkoxy, cyano, C_1–C_4-alkanoyloxy, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkylaminocarbonyloxy, phenyl, C_1–C_4-alkoxycarbonyl or chlorine-, hydroxyl-, C_1–C_4-alkoxy- or phenoxy-substituted C_1–C_4-alkoxycarbonyl,

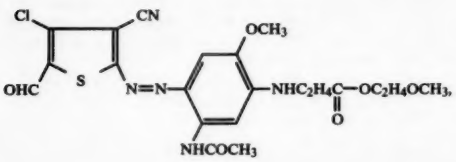
R^5 is hydrogen or C_1–C_6-alkyl which is substituted by phenyl, C_1–C_4-alkoxycarbonyl or chlorine-, hydroxyl-, C_1–C_4-alkoxyl- or phenoxy-substituted C_1–C_4-alkoxycarbonyl,

X is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine or the radical —NH—CO—R^6, where R^6 is C_1–C_4-alkyl, which may be substituted by C_1–C_4-alkoxy, phenoxy, cyano, hydroxyl, chlorine or C_1–C_4-alkanoyloxy, or is unsubstituted or C_1–C_4-alkoxy-substituted phenoxy and

Y is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, and

one or more dyes F selected from the group consisting of monoazo dyes, disazo dyes, anthraquinones, methine dyes, quinophthalones, naphtholactam dyes, coumarin dyes and diphenylamine dyes, said dyes F having an absorption maximum at a wavelength of from 390 to 520 nm, the proportion of the thiopheneazo dyes being from 60 to 99% by weight, based on the total weight of the thiopheneazo dyes and the dyes F in the mixture, except dye mixtures containing

a) the dyes



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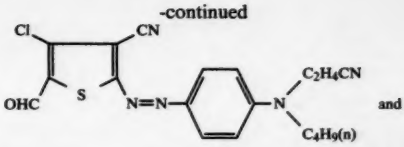
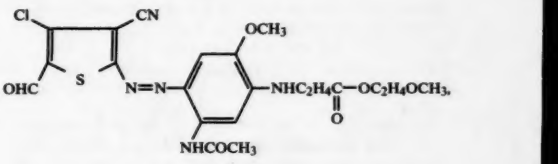
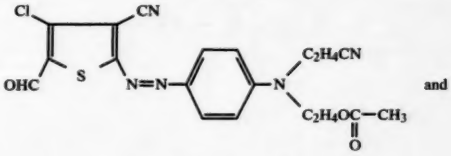


C.I. Disperse Red 54 : 1 in a weight ratio of 33 : 4.25 : 2.75,

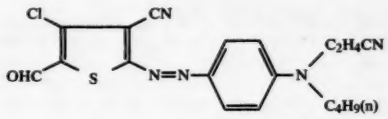
b) the dyes

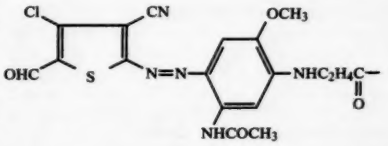


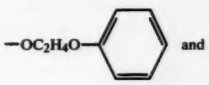


C.I. Disperse Red 54 : 1 in a weight ratio of 31 : 6.3 : 2.7,

c) the dyes

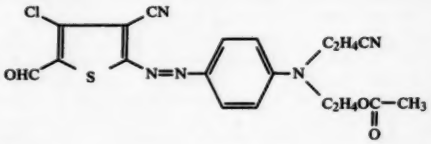


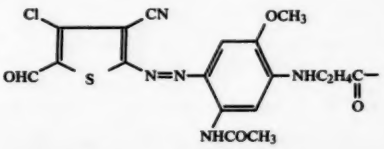




C.I. Disperse Red 167 : 1 in a weight ratio of 6.25 : 33.2 : 0.55 and

d) the dyes





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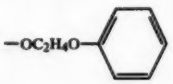


and

C.I. Disperse Red 167 : 1 in a weight ratio of 8 : 31.6 : 0.4.

5,062,862

PROCESS AND APPARATUS FOR RECOVERING A PURE SUBSTANCE FROM A LIQUID MIXTURE BY CRYSTALLIZATION

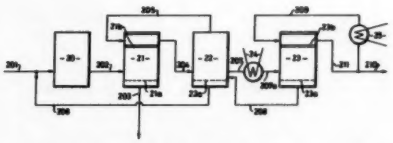
Halbe A. Jansen, Oss, Netherlands, assignor to Grasso's Koninklijke Machinefabrieken N.V., Hertogenbosch, Netherlands

Continuation of Ser. No. 137,677, Dec. 24, 1987, abandoned. This application Sep. 5, 1989, Ser. No. 402,989

Claims priority, application Netherlands, Nov. 29, 1986, 8603314

Int. Cl.[5] B01D *9/00*; **C07C** *7/00, 7/14*

U.S. Cl. 23—295 R **3 Claims**



1. A process for recovering a pure organic substance from an organic liquid mixture, a starting mixture being cooled down in a crystallization zone at a temperature substantially below the freezing point of the pure organic substance to form a pumpable crystal suspension, from which crystals of the pure substance are recovered, wherein

a) the crystal suspension is subjected to a crude separation by feeding it into a first wash column to form a first mother liquor and an upwardly moving crystal bed,

removing crystals together with a few percent of the mother liquor at the top of the crystal bed in the column as a crystal mass, the small amount of mother liquor being due to imperfect washing of the crystal bed,

b) the crystal mass from step a) is subsequently transported to a ripening zone wherein the crystal mass is agitated at a temperature which is higher than that of the crystallization zone and lower than the melting point of the pure substance to be recovered,

a suspension is removed overhead and is introduced into an upper portion of the first wash column of step a) and is used as a wash and transport liquid,

a small stream (bleed stream) of second mother liquor is separated off, and

a crystal suspension containing substantially larger crystals than those in the crystal mass formed in step a) is removed from a lower portion of the ripening zone,

c) the crystal suspension containing substantially larger crystals from step b) is transported to a second wash column wherein the temperature of the crystals which move through the second wash column increases from the temperature of the ripening zone to the temperature of the melting point of the pure substance,

the crystal suspension is separated into a third mother liquor having substantially the same composition as the second mother liquor formed in step b), which is at least partially returned to the ripening zone of step b) and a washed crystal mass is recovered from an upper portion of the second wash column, and

d) a portion of said crystal mass from step c) is heated and returned as a wash and transport liquid to the top of the second wash column.

5,062,863

FUEL COMPOSITIONS CONTAINING POLYALKYLATED 1,3,4-THIADIAZOLES

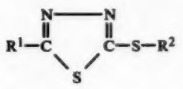
Thomas J. Karol, Norwalk, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed May 17, 1990, Ser. No. 524,538

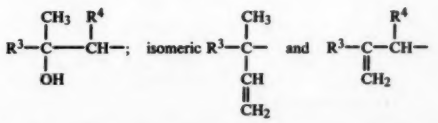
Int. Cl.[5] C10L *5/00*

U.S. Cl. 44—341 **5 Claims**

1. A diesel fuel composition characterized by improved wear properties and comprising a major portion of middle distillates boiling in the range of about 163° C. to 400° C. and a minor wear improving amount of a polyalkylated 1,3,4-thiadiazole selected from the group of compounds having the structural formula



wherein R^1 represents hydroxy, amino, mercapto, alkylthio, 2-hydroxyalkylthio or R^2S- group and R^2 represents a polyolefin residue and is characterized by the formulae



wherein R^3 is an alkyl group having 50 to 400 carbon atoms and R^4 is hydrogen or methyl group.

5,062,864

GAS FILTER ELEMENT

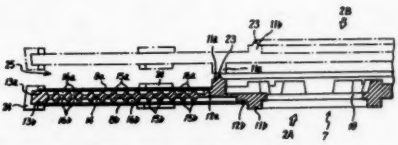
Yoshitomo Hasegawa, and Teruyuki Tsuchiya, both of Soka, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Apr. 2, 1990, Ser. No. 502,869

Claims priority, application Japan, Jul. 11, 1989, 1-81353

Int. Cl.[5] B01D *46/12*

U.S. Cl. 55—495 **7 Claims**



1. A gas filter element comprising:

a plural number of units each having a flat holder and filter membranes bonded to the opposite sides of said flat holder;

a center opening provided in said holder defining an axial gas passage for effluent filtrate gas;

an annular joint portion formed around said center opening and connectible to an adjacent unit in such a manner as to form an influent gas channel between connected units and to communicate said center opening of the connected units axially with each other;

an annular inner membrane mount portion formed around said joint portion on each side of said holder, said annular inner membrane mount portion being bonded by thermal fusion bonding to inner peripheral portions of said filter membranes;

an outer membrane mount portion formed on each side of

said holder along the outer periphery thereof, said outer membrane mount portion being bonded by thermal fusion bonding to outer peripheral portions of said filter membranes;

a partition plate connecting said inner and outer mount portions with each other;

a large number of parallel ribs provided in closely spaced relation on each side of said holder and each having a gradually diminishing width in section toward an outer end with an arcuate surface with a small radius of curvature;

a large number of gas flow apertures defined by said ribs; and

a plurality of gas flow passages communicating said apertures with said center openings; wherein

said filter membranes are fixed to said holder by thermal fusion bonding only at said inner and outer mount portions; and

said units are securely connected with each other by thermal fusion bonding at said joint portions.

5,062,865

CHEMICALLY BONDED SUPERABRASIVE GRIT

Sy-Hwa Chen, and Chien-Min Sung, both of Salt Lake City, Utah, assignors to Norton Company, Worcester, Mass.

Continuation of Ser. No. 274,651, Nov. 18, 1988, abandoned, which is a continuation of Ser. No. 128,971, Dec. 4, 1987, abandoned. This application Nov. 22, 1989, Ser. No. 441,341

Int. Cl.[5] B24D *3/00*

U.S. Cl. 51—295 **22 Claims**

1. A coated superabrasive grit, comprising superabrasive grit particles having roughened surfaces by chemical and/or mechanical systems, said superabrasive grit being selected from the group consisting of diamond and CBN, a substantially continuous first metallic coating on top of said roughened surfaces and being chemically bonded thereto, said first metallic coating being selected from the group consisting of W, Mo, Ta, Nb, and alloys thereof, and a second substantially continuous metallic coating on tope of said first metallic coating, said second metallic coating comprising nickel or copper said first and second metallic coatings having a total thickness in the range of about 1 to 50 microns.

5,062,866

POLYMERIC MEMBRANE AND PROCESS FOR SEPARATION OF ALIPHATICALLY UNSATURATED HYDROCARBONS

W. S. Winston Ho, Annandale, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 433,464, Nov. 8, 1989, abandoned, which is a continuation of Ser. No. 256,665, Oct. 13, 1988, abandoned. This application Aug. 20, 1990, Ser. No. 569,573

Int. Cl.[5] B01D *53/22, 71/28*

U.S. Cl. 55—16 **22 Claims**

1. Process for separating at least one unsaturated hydrocarbon from a hydrocarbon feed steam containing said unsaturated hydrocarbon by the steps of:

a. contacting the feed stream against a first side of a solid, homogeneous membrane comprising a hydrophilic polymer selected from the group consisting of a polyvinylalcohol, polyvinylacetate, sulfonyl-containing polymers, polyvinylpyrrolidone, polyethylene oxide, polyacrylamide, copolymers thereof, and blends thereof a transition metal or transition metal ion capable of reversibly complexing with the unsaturated hydrocarbon, and a hydrophilic salt of a Group I metal; and

b. withdrawing at a second side of the membrane a permeate comprising the unsaturated hydrocarbon in higher concentration than in the feed stream.

14. A solid, homogeneous membrane for separating at least one unsaturated hydrocarbon from a hydrocarbon stream containing said unsaturated hydrocarbon, said membrane comprising a hydrophilic polymer selected from the group consisting of polyvinylalcohol, polyvinylacetate, sulfonyl-containing polymers, polyvinylpyrrolidone, polyethylene oxide, polyacrylamide, copolymers thereof, and blends thereof, a transition metal or transition metal ion capable of reversibly complexing with the unsaturated hydrocarbon, and a hydrophilic salt of a Group I metal.

5,062,867

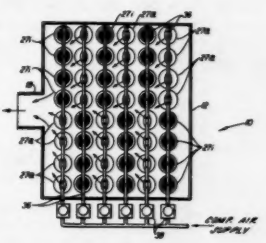
METHOD OF RETROFITTING A DUST COLLECTING APPARATUS

William J. Klimczak, Charlotte, N.C., assignor to Dustex Corporation, Charlotte, N.C.

Filed Dec. 14, 1989, Ser. No. 450,854

Int. Cl.[5] B01D *46/04*

U.S. Cl. 55—96 **6 Claims**



1. A method of retrofitting a dust collecting apparatus comprising a housing having a transverse panel dividing said housing into an inlet chamber and an outlet chamber, with said panel having a plurality of openings arranged in parallel rows of spaced apart openings, a plurality of elongate filter bag elements each having an open end and a closed end, with said bag elements being mounted to said panel such that said open ends are in registry with respective ones of said openings in said panel and the bag elements depend into said inlet chamber, and reverse pulse cleaning means for periodically directing a reverse pulse of air into all of the bags of each row, with said reverse pulse cleaning means comprising an air delivery pipe positioned in said outlet chamber in alignment above each of said rows of openings, each of said pipes having a single air outlet which is aligned above each opening in said panel for directing the pulse into the associated panel opening, and valve means for sequentially introducing high pressure air into each of said pipes, said method comprising the steps of

selecting a plurality of the bag elements to be active filtering bag elements and the remaining nonselected bag elements to be inactive bag elements, with the active and inactive bag elements being arranged in a predetermined pattern such that the inactive bag elements physically shield the active bag elements from the particulate matter which is expelled from the active bag elements of adjacent rows during the reverse cleaning thereof, and

closing the air outlet in the air delivery pipe above all of the non-selected inactive bag elements.

5,062,868

METHOD AND APPARATUS FOR UNLOADING MOBILE VACUUM LOADERS

Michael R. Kennedy, Point Pleasant, N.J., assignor to Aaxon Industrial, Inc., Avenel, N.J.

Filed Aug. 9, 1990, Ser. No. 564,611

Int. Cl.[5] B01D *46/00*

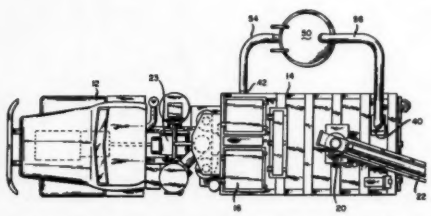
U.S. Cl. 55—97 **3 Claims**

1. A method for cleaning and removal of particulate matter collected in a mobile vacuum loader wherein the particulate matter suspended in an airstream is introduced into said mobile vacuum loader and subjected to a flow path whereby heavier particulate matter is first collected in a debris box; said debris box in communication by means of a conduit with a subsequent

bag filter chamber for the further collection of particulate matter suspended in said airstream, said bag filter chamber in communication by means of a conduit with a subsequent cyclone separator for further removal of particulate matter suspended in said airstream, said airstream exiting said cyclone separator substantially free of said particulate matter, said airstream discharged through a blower means, said particulate matter collected in said bag filter chamber being mechanically evacuated from said bag filter chamber to said debris box, said method for cleaning and removing said particulate matter collected in said debris box of said mobile vacuum loader comprising:

sealing said conduit from said debris box to said bag filter chamber so as to isolate said debris box from said bag filter chamber and prevent the passage of air and particulate matter therethrough;

positioning a bag separation means adjacent said mobile vacuum loader, said bag separation means having an inlet and an outlet, said bag separation means having a sealable bag secured therein;



positioning an outlet means on said debris box, said outlet means in communication with said inlet means on said bag separation means, said communication means comprising a conduit from said debris box to said bag separation means;

positioning an inlet means on said mobile vacuum loader, said inlet means secured to said bag filter chamber, said inlet means in communication with said outlet means on said bag separation means;

drawing negative pressure in said debris box by means of said blower on said mobile vacuum loader, thereby defining a path for air and particulate matter from said debris box through said outlet means on said debris box to said bag separation means, and from said bag separation means to said bag filter chamber by way of said inlet means to said bag filter chamber and thence to said cyclone filters and thence to said blower means, thereby removing and collecting said particulate matter from said debris box into said bag separation means for collection and disposal.

5,062,869

WATER SEPARATOR FOR AIR DATA SENSOR

Floyd W. Hagen, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 412,907, Sep. 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 320,416, Mar. 8, 1989, abandoned. This application Oct. 10, 1990, Ser. No. 596,735

Int. Cl.[5] B01D *53/00*

U.S. Cl. 55—159 **15 Claims**

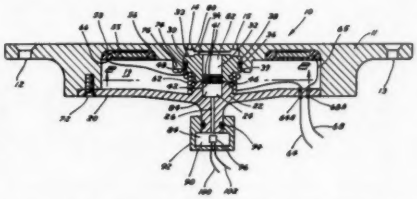
1. Apparatus coupled to the atmosphere for providing air from which water has been separated such that at least one parameter of the air can be measured, comprising:

a housing having an aperture which opens to the atmosphere;

a chamber having an opening to receive the air to be measured from the housing;

the housing providing passageway means coupling air from the aperture to the opening; and

water separating means disposed in the passageway means having an airflow port therethrough, the water separating means preventing air from moving through the passage-



way except through the port, which port is configured to substantially prevent water from passing therethrough.

5,062,870

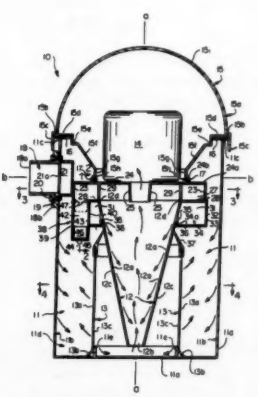
SHUT-OFF DEVICE FOR CYCLONIC VACUUM CLEANER

James Dyson, Bathford, England, assignor to Notetry Limited, England

Filed Jul. 6, 1990, Ser. No. 549,080

Int. Cl.[5] B01D *39/12*

U.S. Cl. 55—213 **37 Claims**



1. In a cleaning apparatus including a container comprising a bottom and a sidewall extending to and meeting the bottom, the sidewall having an interior surface, a dirty air inlet at an upper portion of the container spaced from the bottom which is oriented for supplying dirt laden air into the container and having an air outlet from the container at the upper portion of the container; and means for generating an airflow which passes sequentially through the dirty air inlet and the container, and depositing the dirt in the container and then exiting from the container through a clean air outlet the improvement in a dirt level sensing means comprising:

(a) a housing means mounted inside the container between the dirty air inlet and the clean air outlet and providing an air passage to the clean air outlet from the container, the housing means extending from an opening to the clean air outlet and having a plurality of perforations through the housing means which provide the air passage through which the air flows between the dirty air inlet and the clean air outlet; and

(b) a valve means slideably mounted inside the housing means wherein some of the perforations in the housing means are below the valve means and wherein in operation of the cleaner, the valve means rests in the housing means with the airflow from the container passing through the perforations in the housing means that provide the air passage through the housing means, before

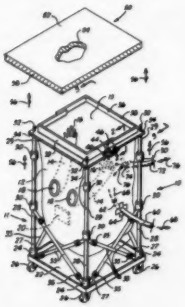
entering the clean air outlet from the container as dirt is being accumulated in the container, and wherein when dirt in the container partially covers at least some of the perforations in the housing means thus reducing the air passage to the clean air outlet from the container, a pressure gradient occurs between the inside of the container and the air inlet to the cyclone so that the valve means moves in the housing means to close off the opening to the clean air outlet to stop the airflow to the clean air outlet from the container.

5,062,871

SYSTEM FOR LOCALIZING A PORTION OF A STRUCTURE FOR TREATMENT

Walter B. Lemon, III, Mesa County, Colo., assignor to Seth C. Hunt, Denver, Colo.

Filed Nov. 13, 1989, Ser. No. 435,089
Int. Cl.[5] B01D *46/42*; B08B *7/04*
U.S. Cl. 55—259 **14 Claims**



1. A system for isolating a localized portion of a to-be-treated structure by adjustably supporting an opening of a debris containment bag around a to-be-treated portion of a structure, comprising:

a base;

a bag attachment frame defining an open area, and including means for releasably receiving open bags, wherein said bag attachment frame is adjustable so that it is adjusted to releasably receive bags having different size openings; and

an adjustable means connected to and carried by said base and affixed to said bag attachment frame for adjusting the location of said bag attachment frame and the opening of an attached bag around a to-be-treated portion of a structure to thereby isolate such a to-be-treated portion when a bag is present.

5,062,872

AIR FILTER WITH HORIZONTAL FILTER ELEMENTS

Roger D. Williams, Dallas, N.C., assignor to Pneumafil Corporation, Charlotte, N.C.

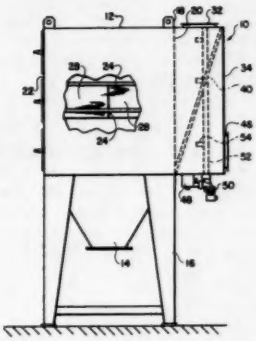
Filed May 12, 1989, Ser. No. 351,095
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—302 **14 Claims**

1. Apparatus for filtering dust and the like entrained in a flow of transport air or other gas, said apparatus comprising:

(a) generally enclosed housing means having a side wall, an upper filtering portion and a lower collection portion;

(b) a plurality of filter elements disposed in said upper portion of said housing, each said filter element being generally hollow and mounted with its central axes extending substantially horizontally away from said side wall, and said filter elements being arranged in two generally vertical columns lying in spaced relation to one another and with a predetermined spacing between each filter element;

(c) inlet means located at said side wall for introducing said transport air and entrained foreign matter into said housing, said inlet means including an inlet opening in said side wall of said housing located between said columns of filter elements, and said inlet means being formed to direct said transport air in a predetermined flow path directed downwardly toward said lower housing portion and generally alongside the exterior surfaces of said filter elements in said vertical columns, whereby heavier particles of foreign matter entrained in said transport air will be carried directly to the lower portion of said housing for collection thereat and lighter particles of foreign matter will be separated from said transport air by said filter elements; and



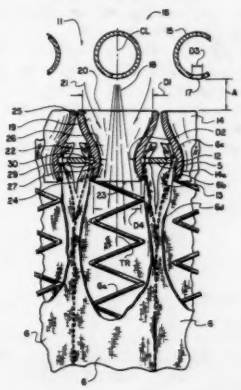
(d) outlet means communicating with the interiors of said filter elements for permitting removal of said cleaned transport air when said transport air flows from said inlet means and through said filter elements.

5,062,873

DEVICE AT A FILTER HOSE

Roger S. Karlsson, Södra Ingelsträde, 263 91 Höganäs, Sweden

Filed May 7, 1990, Ser. No. 520,049
Claims priority, application Sweden, May 12, 1989, 8901704
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—302 **8 Claims**



1. Device at a filter hose, forming part of a hose filter, whereby contaminated gases (7) are brought to flow into the filter hose (6) for depositing contaminants (9) on the outer side of the filter hose (6), whereby the gases are brought to flow out of the filter hose (6) to a clean-gas zone (11) through a sleeve (14), whereby at least one compressed-air nozzle (17) is pro-

vided in the clean-gas zone (11) at a distance from the sleeve (14) and adapted to guide a blow-like flow (18) of compressed air through the sleeve (14) into the filter hose (6) for momentarily expanding said hose and thereby loosen the contaminants (9) deposited on the outer side of the filter hose (6), and whereby the sleeve (14) has an end portion (14*a*) defining a compressed-air discharge zone (24) through which the compressed air flows from the sleeve (14) into the filter hose (6), characterized in that the filter hose (6) engages and/or is connected to the end portion (14*a*) of the sleeve (14), the sleeve (14) has anchoring portions (29) for mounting the filter hose (6) at a filter cassette (4) forming part of the hose filter (3), the sleeve (14), is insertable into apertures (12) in anchoring portions (5) in the filter cassette (4) for clamping the filter hose (6) by means of said sleeve (14).

5,062,874

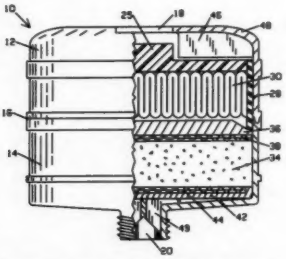
FILTER SEALING APPARATUS

Pierre Legare, Ontario, Canada, and David W. Pike, Salisbury, England, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Jun. 5, 1990, Ser. No. 533,626

Int. Cl.[5] B01D *50/00*

U.S. Cl. 55—337 **29 Claims**



20. A sealant deflector for deflecting sealant toward a wall of a fluid filter housing during sealing in assembly of said fluid filter, said fluid filter including an inlet and an outlet with a filtering media situated therebetween, comprising:

deflecting means including a deflection surface for receiving a quantity of sealant in liquid state through one of said inlet and outlet while said deflecting means is rotating within said fluid filter housing during said sealing step and for flinging said sealant outward;

support means for carrying said deflecting means;

fixing means for permanently fixing said support means and thus said deflecting means in a predetermined location below one of said inlet and outlet within said fluid filter housing; and

said fixing means further comprising self-centering means, for disposing said support means in a central area of said fluid filter, including a plurality of arms extending radially from said support means.

5,062,875

AIR CLEANER

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

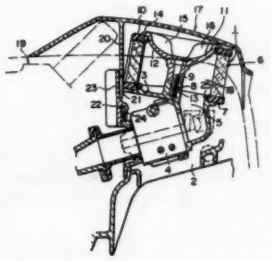
Filed Nov. 13, 1990, Ser. No. 611,586

Claims priority, application Japan, Dec. 4, 1989, 1-140400[U]

Int. Cl.[5] B01D *46/10*

U.S. Cl. 55—493 **2 Claims**

1. An air cleaner comprising: a base body which includes a boss section and an outlet passage, a cylindrical filter element having an upper end section and a lower and section which is situated on said base body, a cover member which includes a bolt protruding from the center of its lower surface and which is adapted to be engaged with a tapped hole formed in the boss section of said base body and which is adapted to be engaged with the upper end section of said filter element so as to enclose the internal space of said filter element, and said cover member



has a downwardly concave central outer surface portion, said outer surface portion having a pair of integrally formed thin diametrical protrusions which extend radially inwards from the periphery and which serve as a handle.

5,062,876

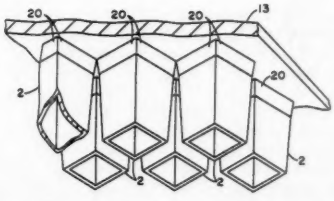
METHOD AND APPARATUS FOR FORMING ROUND GLASS FIBERS

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 357,157, May 26, 1989, abandoned. This application Jul. 12, 1990, Ser. No. 551,986

Int. Cl.[5] C03B *37/08*

U.S. Cl. 65—1 **12 Claims**



1. An apparatus for producing continuous round glass fibers by drawing molten glass streams from tips of a bushing comprising:

a lower bushing tip plate for discharging streams of molten glass having a viscosity of approximately 500 poise or less, said plate being positioned in a container for holding said molten glass;

a plurality of discrete, spaced apart, hollow tips extending downwardly from said lower plate, said tips including;

wall members defining the shape of said tip wherein said wall members of each of said tips are spaced from wall members of adjacent tips and said tips are arranged in groups of rows to accommodate the flow of molten glass therethrough while minimizing the potential for flooding between said tips; and

a lower end spaced from said lower plate wherein the cross-section of said lower end of said tips is substantially a regular polygon in shape; and

means to allow said glass fibers to retain said viscosity for sufficient period of time such that surface tension forces in said glass fibers can act on said fibers to change their cross-section from an initial shape corresponding to the said regular polygon shaped cross-section of said lower end of said tips to a round shape.

5,062,877

METHOD FOR MAKING AN OPTICAL DEVICE

Nicholas F. Borrelli, Elmira, and Dennis W. Smith, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 432,160, Nov. 6, 1989, abandoned. This application Apr. 9, 1990, Ser. No. 506,078

Int. Cl.[5] C03C *10/10*

U.S. Cl. 65—30.13 14 Claims

1. In a method for making an optical device wherein a photonucleable, lithium silicate glass body is selectively crystallized to provide a crystalline matrix surrounding each lens in an array of spherically-shaped clear lenses integral with and rising above at least one matrix surface wherein sodium and/or potassium ions from an external source are exchanged for lithium ions within the surface of said clear lenses to create variable alkali metal ion concentrations defined by both radial and axial concentration gradients, the improvement comprising conducting said exchange of sodium and/or potassium ions for lithium ions at a temperature between about 25°–125° C. above the annealing point of said glass for a period of time sufficient to produce lenses which in diameters of 1 mm and larger have axial heights in excess of 20 microns.

5,062,878

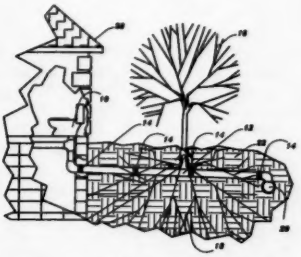
METHOD AND APPARATUS FOR CLEARING FLORA FROM SEWER LINES

Timothy W. Tobiason, Silver Creek, Nebr., assignor to Toby's Chemical Company, Silver Creek, Nebr.

Filed Nov. 13, 1989, Ser. No. 436,071

Int. Cl.[5] A01N *25/16, 55/02*

U.S. Cl. 71—65 10 Claims



1. A flora growth inhibitor product adapted for inhibiting the growth of flora in a sewer line, comprising:

a herbicide;

a dry acid;

a carbonate; and

a surfactant mixed with said acid carbonate and said whereby foam is produced in water for vertically elevating said herbicide such that flora roots growing within a sewer line are coated with said herbicide thereby inhibiting growth of flora in a sewer line.

5,062,879

8-AZOLYLMETHYLQUINOLINES AND HERBICIDAL USE THEREOF

Rainer Seele, Fussgoenheim; Gunter Brill, Hassloch; Reiner Kober, Fussgoenheim; Thomas Saupe, Sandhausen; Karl-Otto Westphalen, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

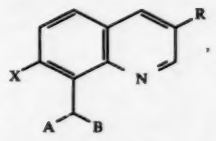
Filed May 9, 1990, Ser. No. 520,810

Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917234; Aug. 1, 1989, 3925422

Int. Cl.[5] C07D *401/06;* A01N *43/653*

U.S. Cl. 71—92 6 Claims

1. A substituted 8-azolylmethylquinoline of the formula I



I

where R is hydrogen, halogen, cyano or C_1–C_4-alkyl or partially or completely halogenated C_1–C_4-alkyl;

X is halogen;

A is; pyrazol-1-yl, imidazol-1-yl, 1,2,4-triazol-1-yl, 1,3,4-triazol-1-yl, 5-mercapto-1,2,4-triazol-1-yl, 5-mercapto-1,3,4-triazol-1-yl or is imidazol-1-yl which at each carbon atom can bear one of the following substituents: halogen, thiol, nitro, cyano, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulfonyl, or a group CO—R^1, R^1 denoting C_1–C_4-alkoxy or amino;

B is chlorine, bromine, C_1–C_4-alkoxy, C_1–C_4-alkylthio or —(NR^2R^3), R^2 and R^3 denoting hydrogen, C_1–C_4-alkyl or C_1–C_4-acyl; ZR^4, R^4 denoting phenyl which may bear a nitro, cyano or phenoxy group and up to 3 of the following substituents: halogen, C_1–C_4-alkyl which may bear up to 3 halogen atoms, or C_1–C_4-alkoxy, and Z is oxygen, sulfur or —(NR^5)—, R^5 being hydrogen or C_1–C_4-alkyl,

and the salts and metal complexes of I with acids or metals which do not impair the herbicidal action of I.

6. A process for combating the growth of unwanted plants, wherein a herbicidally effective amount of a substituted 8-azolylmethylquinoline of the formula I, or an acid addition salt or metal complex thereof as set forth in claim 1 is allowed to act on plants, their habitat or seed.

5,062,880

1-ARYL-1,4-DIHYDRO-4-OXO-5-CARBOXYPYRIDAZINE DERIVATIVES AND THEIR USE AS PLANT GROWTH REGULATORS AND HYBRIDIZING AGENTS

Dennis R. Patterson, North Wales, Pa., assignor to Monsanto Company, St. Louis, Mo.

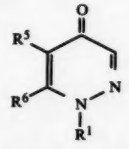
Continuation of Ser. No. 351,309, May 4, 1989, abandoned, which is a continuation of Ser. No. 167,612, Mar. 14, 1988, abandoned, which is a continuation of Ser. No. 551,438, Nov. 14, 1983, Pat. No. 4,732,603, which is a continuation of Ser. No. 193,677, Oct. 3, 1980, abandoned. This application Dec. 19, 1989, Ser. No. 453,336

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[5] C07D *237/24, 309/36;* A01N *43/58;* C07B *43/04*

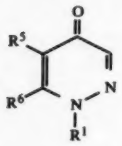
U.S. Cl. 71—92 16 Claims

1. A compound of the formula:



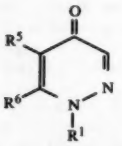
wherein R^1 is an alkyl group or is an aryl group substituted with up to three substituents selected from the group consisting of halogen, nitro, trihalomethyl, (C_1–C_4)alkoxy, (C_1–C_4)alkyl and cyano; R^5 is a carboxy (COOH) group or an alkali metal salt thereof, or a carbamide (CONRR) group wherein R is an alkyl group and the agronomically acceptable acid addition salts thereof; and R^6 is an alkyl or is an aryl group optionally substituted with up to three substituents selected from the group consisting of halogen, nitro, trihalomethyl, (C_1–C_4)alkoxy, (C_1–C_4)alkyl and cyano.

2. A compound of the formula



wherein R^1 is phenyl substituted with 4-Cl, 3, 4-Cl_2, 4-Br; R^5 is a carboxy (COOH) group or an alkali metal salt thereof; and R^6 is CH_3 or C_2H_5.

3. A compound of the formula:



wherein R^1 is an alkyl group or is an aryl group substituted with up to three substituents selected from the group consisting of halogen, nitro, trihalomethyl, (C_1–C_4)alkoxy, (C_1–C_4)alkyl and cyano; R^5 is a carboxy (COOH) group or the alkali metal salt thereof and the agronomically acceptable acid addition salts thereof; and R^6 is an alkyl or is an aryl group optionally substituted with up to three substituents selected from the group consisting of halogen, nitro, trihalomethyl, (C_1–C_4)alkoxy, (C_1–C_4)alkyl and cyano.

13. A method for inducing male sterility in a cereal grain plant which comprises treating the plant prior to meiosis with a compound of claim 2 in an amount from about 0.125 to about 10 pounds per acre, which amount is effective to produce male sterility in the plant.

15. A method for producing hybrid cereal grain seed comprising treating a female parent of the cereal grain prior to meiosis with a compound of claim 1 or 2 in an amount sufficient to produce male sterility in the plant, pollinating the female parent with pollen from an untreated male parent which is of a different line from the female parent and allowing the female parent to produce the seed.

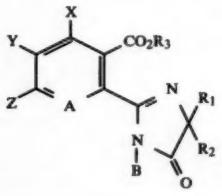
5,062,881

2-(1-SUBSTITUTED-2-IMIDAZOLIN-2-YL)BENZOIC AND NICOTINIC ACIDS AND A METHOD FOR THEIR PREPARATION

Michael A. Guaciaro, Hightstown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 20, 1989, Ser. No. 453,659
Int. Cl.[5] A01N *43/40;* **C07D** *401/04*
U.S. Cl. 71—92 **12 Claims**

1. A compound having the formula I structure:



(I)

wherein
X is hydrogen, halogen or methyl;
Y and Z are each hydrogen, halogen, C_1–C_6 alkyl optionally substituted with C_1–C_3 alkoxy; C_1–C_3 alkoxy, phenoxy, C_1–C_3 haloalkyl, trifluoromethoxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkylthio, formyl, difluoromethoxy, 1,1,2,2-tetrafluoroethoxy, nitro, cyano, C_1–C_4 alkylsulfonyl, C_2–C_6 alkenyl optionally substituted with halogen; C_2–C_6 alkynyl optionally substituted with halogen; or phenyl optionally substituted with C_1–C_3 alkyl, C_1–C_3 alkoxy, or halogen;
A is nitrogen;
B is hydroxyl, cyano, halogen, or

R_1 is C_1–C_4 alkyl;
R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl;
R_3 is hydrogen,
C_1–C_6 alkyl optionally substituted with C_1–C_3 alkoxy, halogen, C_3–C_6 cycloalky, benzyl, furyl, trimethylsilyl, phenyl, halophenyl, C_1–C_4 alkylphenyl, C_1–C_4 alkoxyphenyl, or nitrophenyl;
C_3–C_6 alkenyl optionally substituted with C_1–C_3 alkoxy, phenyl, halogen or C_1–C_4 alkoxycarbonyl;
C_3–C_6 cycloalkyl optionally substituted with C_1–C_3 alkyl;
C_3–C_6 alkynyl optionally substituted with C_1–C_3 alkyl; or
a cation of alkali metals, ammonium or organic ammonium;
R_5 is C_1–C_4 alkyl;
the N-oxides thereof, when R_3 is not unsaturated alkyl and Y and Z cannot be unsaturated alkyl or alkylthio;
the optical isomers thereof, when R_1 and R_2 represent different substituents; and
the acid addition salts thereof, when R_3 is other than a cation.

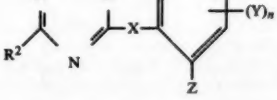
5,062,882

TRIAZINE HERBICIDES

Trevor W. Newton, Sittingbourne, and Alastair McArthur, Oare, both of England, assignors to Shell International Research Maatschappij B. V., Netherlands

Filed Mar. 16, 1989, Ser. No. 324,440
Claims priority, application United Kingdom, Apr. 7, 1988, 8808071
Int. Cl.[5] A01N *43/66, 43/68;* **C07D** *251/46, 251/52*
U.S. Cl. 71—93 **9 Claims**

1. A compound of the formula I



(I)

wherein
R^1 and R^2 each independently represent a hydrogen or halogen atom, or an optionally substituted C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, C_{3-8} cycloalkyl, C_{1-12} alkoxy, C_{2-12} alkenyloxy, C_{2-12} alknyloxy, phenyloxy, C_{1-12} alkylthio, C_{2-12} alkenylthio, C_{2-12} alkynylthio, phenylthio or amino group, or a formyl, optionally substituted C_{1-12} alkylcarbonyl, cyano, carboxy, optionally substituted C_{1-12} alkoxycarbonyl, dialkylaminoxy, dialkyliminoxy or azido group;
x represents an oxygen or sulphur atom or a group —SO_2—, —SO— or —NR^4— where R^4 represents a hydrogen atom or an optionally substituted alkyl group;
n is an integer from 1 to 4;
Y represents a hydrogen atom or each Y independently

represents a halogen atom, a hydroxy group or an optionally substituted C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, phenyl, C_{1-12} alkoxy, C_{2-12} alkenyloxy, C_{2-12} alkynyloxy, phenyloxy, C_{1-12} alkythio, C_{2-12} alkenylthio C_{2-12} alkynylthio, phenylthio or amino group, or a formyl, optionally substituted alkylcarbonyl, cyano or nitro group, or, when n is at least 2, two groups Y may be linked to form a fused saturated carbocyclic ring; and

Z represents a hydroxyalkyl, hydroxybenzyl, or mono-, di- or trialkoxyalkyl group, a group —CH=NOH, or an optionally esterified carboxyalkyl group, or a group COR^3 where R^3 represents a hydrogen or halogen atom, or a hydroxy group, or an optionally substituted C_{1-12} alkyl, phenyl, C_{2-12} alkenyl, C_{2-12} alkynyl, C_{1-12} alkoxy, C_{2-12} alkenyloxy, C_{2-12} alkynyloxy, cycloalkyloxy, phenyloxy, dialkylaminoxy, dialkyliminoxy, amino, C_{1-12} alkylthio, phenylthio, C_{2-12} alkenylthio or C_{2-12} alkynylthio group, or a carboxylic acid salt of a compound of formula I with an equivalent amount of an inorganic or organic cation,

said optional substituents for alkyl, alkenyl, alkynyl, alkoxy, alkenylthio, alkylcarbonyl, and alkoxycarbonyl groups being independently selected from one or more of halogen, C_{1-12} alkoxy, hydroxy, C_{1-12} alkylthio, phenylthio, phenyl, alkylsulphinyl, alkylenedioxy, alkylenedithio, haloalkyl, and alkoxycarbonyl groups, thienyl groups and dialkyliminoxy, optionally substituted amino, trialkylsilyl, alkylcarbonyl, phenylcarbonyl, alkoxycarbonyl, carboxy, cyano, thiocyanate, and optionally substituted aminocarbonyl groups,

said optional substitutents for phenyl, cycloalkyl, phenyloxy or phenylthio groups may be independently selected from one or more of halogen atoms and nitro, cyano, C_{1-12} alkyl, C_{1-12} haloalkyl, C_{1-12} alkoxy, C_{1-12} alkylthio, C_{1-12} alkoxycarbonyl and aralkoxycarbonyl groups,

said optional substitutents for an amino group being independently selected from C_{1-12} alkyl, C_{1-12} alkoxy, amino, mono or dialkylamino, arylamino, alkoxyalkyl, haloalkyl, hydroxy, hydroxyalkyl, carboxyalkyl or alkylcarbonylamino, or the amino group may form part of a pyrrolidinyl or morpholino ring.

7. A herbicidal composition which comprises an effective amount of a herbicidal compound as defined in claim 1 together with a carrier.

5,062,883

SPIRO-BENZYL-3-SUBSTITUTED PYRIDINES

Yoshio Kurahashi; Toshio Goto; Kunihiro Isono, all of Tokyo; Yoshinori Kitagawa, Tochigi; Tetsuji Izumi; Toshihito Kondo, both of Tokyo, and Takayo Sato, Gunma, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

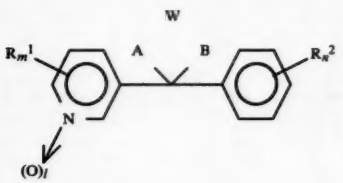
Division of Ser. No. 334,650, Apr. 6, 1989, Pat. No. 5,000,778, which is a continuation-in-part of Ser. No. 268,913, Nov. 8, 1988, Pat. No. 4,940,483. This application May 3, 1990, Ser. No. 518,640

Claims priority, application Japan, Nov. 10, 1987, 62-282211; May 30, 1988, 63-130168

Int. Cl.[5] **C07D** *405/06, 409/06;* **A01N** *43/40*

U.S. Cl. 71—94 **6 Claims**

1. A 3-substituted pyridine of the formula



wherein

R^1 represents hydrogen, halogen, lower alkyl, or halo-lower alkyl,

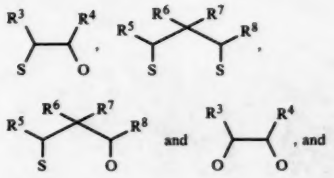
R^2 represents hydrogen, halogen, lower alkyl, phenyl, halo-lower alkyl or phenoxy,

l is 0 to 1,

m is an integer from 1 to 4,

n is an integer from 1 to 5, and

A-W-B represents a member selected from the group consisting of



in which

R^3 and R^4 each represent hydrogen, hydroxy lower alkyl, lower alkoxy-lower alkyl, benzyloxy-lower alkyl, halo-lower alkyl or carboxy-lower alkyl, or

R^3 and R^4 form a hydrocarbon ring having 3 to 12 carbon atoms in total together with the carbon atoms to which then are bonded, and

R^5, R^6, R^7 and R^8 each represent hydrogen, lower alkyl or hydroxy-lower alkyl.

5,062,884

N-SUBSTITUTED 3,4,5,6-TETRAHYDROPHTHALIMIDES AND THEIR INTERMEDIATES

Peter Plath, Frankenthal; Karl Eicken, Wachenheim; Norbert Goetz, Worms; Jochen Wild, Deidesheim; Norbert Meyer, Ladenburg, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

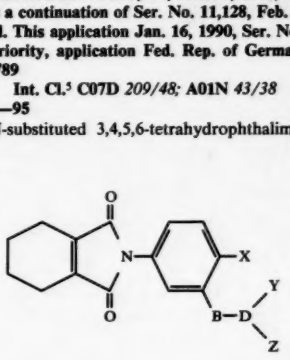
Continuation of Ser. No. 296,355, Jan. 10, 1989, abandoned, which is a continuation of Ser. No. 11,128, Feb. 5, 1987, abandoned. This application Jan. 16, 1990, Ser. No. 463,817

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1986, 3603789

Int. Cl.[5] **C07D** *209/48;* **A01N** *43/38*

U.S. Cl. 71—95 **5 Claims**

1. An N-substituted 3,4,5,6-tetrahydrophthalimide of the formula



where

X is Cl or Br,

Z is $—CO_2R^2$,

R^2 is H, C^1–C_6-alkyl, or C_5- or C_6-cycloalkyl, C_1–C_4-alkoxy-C_2–C_4alkyl, $C_1$14 C_4-alkylmercapto-C_2–C_4-alkyl, propargyl, benzyl, α-phenylethyl, α-phenylpropyl, C_2–C_4-alkyl which is monosubstituted, di- or tri-substituted by F or Cl, or CH_3-substituted or Cl-substituted allyl,

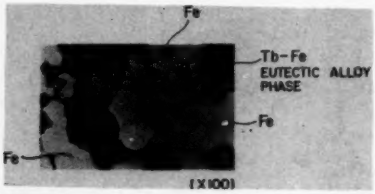
and either (1) B is $—CH_2—$, D is —CH, and Y is —H, C_1–C_7-alkyl, or $—CO_2R^2$ or (2) B is —CH=, D is =C, and Y is C_1–C_7-alkyl, Cl, Br, CN, or $—CO_2R^2$.

5,062,885

RARE EARTH METAL-IRON GROUP METAL TARGET, ALLOY POWDER THEREFOR AND METHOD OF PRODUCING SAME

Shunichiro Matsumoto, Yasugi; Tsutomu Inui; Rokuo Ichiyasu, both of Yonago, and Yoshitaka Chiba, Gyoda, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Division of Ser. No. 183,993, Apr. 20, 1988, Pat. No. 4,957,549.
This application Jun. 26, 1990, Ser. No. 543,375
Claims priority, application Japan, Apr. 20, 1987, 62-97057
Int. Cl.[5] B22F *1/00*
U.S. Cl. 75—255 3 Claims



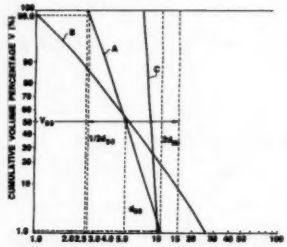
1. Alloy powder for manufacturing a metal target, each particle of the powder having a two phase structure in which an α-phase of at least one rare earth metal and an intermetallic compound phase composed of said at least one rare earth metal and at least one iron group metal are uniformly and finely dispersed.

5,062,886

PROCESS FOR PRODUCING METAL POWDER HAVING CONTROLLED PARTICLE SIZE DISTRIBUTION FOR METALLIC PIGMENTS

Sinya Ozawa; Katsumi Kondo, and Kajin Saito, all of Nara, Japan, assignors to Showa Alumi Powder K.K., Nara, Japan

Division of Ser. No. 406,388, Sep. 11, 1989, Pat. No. 4,976,777.
This application Jun. 1, 1990, Ser. No. 531,593
Claims priority, application Japan, Sep. 9, 1988, 63-226197
Int. Cl.[5] B22F *9/04*
U.S. Cl. 75—371 5 Claims



1. Process for producing a graded metal powder, comprising:

(a) providing a metal powder having a mean particle size of not greater than about 30 μm,

(b) providing a mineral oil,

(c) mixing said mineral oil with a nonionic-anionic surfactant having an HLB value of from about 5.5 to about 11.5, in a proportion of from about 1.8 to about 3.0% by weight based on the amount of said metal powder,

(d) dispersing said metal powder in said mineral oil containing said nonionic-anionic surfactant to form slurry, and

(e) subjecting said slurry to sedimentation to classify said metal particles in said slurry.

5,062,887

PROCESS FOR CHLORIDE REMOVAL FROM SPONGE METAL

Hani A. M. Abodishish, Ogden; R. James Adams, West Point, and Joseph B. White, Ogden, all of Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 8, 1991, Ser. No. 652,694
Int. Cl.[5] C22B *34/14*
U.S. Cl. 75—425 9 Claims

1. A process of removing residual magnesium chloride trapped in the pores of a sponge metal product that was produced from a metal tetrachloride by the use of magnesium metal as a reductant and that has had magnesium chloride removed therefrom, comprising charging into a distillation furnace a quantity of said sponge metal product and pure virgin magnesium metal in amount from about 20% to about 40% by weight of said quantity of sponge metal product; heating the material in said furnace under positive pressure at a temperature and for a time sufficient to melt said virgin magnesium metal and to wet said sponge metal product therewith and open the pores thereof; still under positive pressure, lowering the temperature in said furnace sufficiently, and maintaining the lowered temperature for a time sufficient, to solidify said molten magnesium; applying a vacuum within said furnace and raising the temperature therein sufficiently and maintaining the raised temperature for a time sufficient to vaporize most of the magnesium metal and remove it from the furnace; and again raising the temperature sufficiently and maintaining it for a time sufficient to remove from the furnace any remaining magnesium metal and the residual magnesium chloride that was trapped in the pores of the sponge metal.

5,062,888

METHOD OF PRODUCING PRECIPITATE OF RARE EARTH FERROMAGNETIC ALLOY

Shunji Watanabe, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Mar. 7, 1990, Ser. No. 489,699
Claims priority, application Japan, Mar. 7, 1989, 1-54497
Int. Cl.[5] H01F *1/06*
U.S. Cl. 75—739 12 Claims

1. A method of producing ferromagnetic powder, comprising the steps of:

preparing a solution containing a reducing agent which has a boron element, an iron-triads-group element ion, and a rare earth element ion; and

precipitating ferromagnetic powder composed of an alloy of iron-triads-group metal, rare earth metal and boron.

5,062,889

PROCESS FOR THE PREPARATION OF HYDROCOLLOID MIXTURES HAVING IMPROVED DISPERSIBILITY

Frank Höhl, Neuenkirchen, and Jörn Breckwoldt, Rothenburg, both of Fed. Rep. of Germany, assignors to Wolff Walsrode AG, Walsrode, Fed. Rep. of Germany

Filed Jun. 29, 1990, Ser. No. 546,459
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923144
Int. Cl.[5] C09D *101/28*
U.S. Cl. 106—197.2 8 Claims

1. A process for the preparation of hydrocolloid mixtures dispersible in water from at least one uncross-linked hydrocolloid A and at least one cross-linked hydrocolloid B by mixing A and B, characterized in that at least one of the hydrocolloids is subjected to at least one swelling agent or solvent M for the hydrocolloid in a mixing apparatus and vigorously mixed therewith and the agent M is optionally subsequently drawn off, wherein the uncross-linked hydrocolloid is present in at least about 30% by weight, and wherein the hydrocolloid mixture comprises cross-linked methylhydroxyethylcellulose

and uncross-linked methylhydroxyethylcellulose and uncross-linked carboxymethylcellulose.

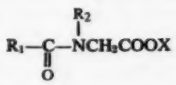
5,062,890

WATER-BASED INK COMPOSITION FOR BALL-POINT PEN

Hiroshi Miyashita, Koshigaya; Hideotoshi Hamamoto, Ishioka; Shigeru Nagai, Toda; Makoto Yamaguchi, Koshigaya; Onuki Isao, Kasukabe; Hiroshi Takahashi, and Atsushi Ishiguro, both of Ibraki, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 161,289, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 890,377, Jul. 29, 1986, abandoned. This application Oct. 16, 1989, Ser. No. 423,527
Claims priority, application Japan, Jul. 29, 1985, 60-167046
Int. Cl.[5] C09D *11/06*
U.S. Cl. 106—27 7 Claims

1. In a water-based ink composition for a ball-point pen consisting essentially of a pigment; a dispersant for said pigment; a water-soluble organic solvent and water; the improvement wherein the composition contains a metal salt and/or an amine salt of N-acyl sarcosine represented by the following formula:



(I)

where R_1 is a saturated or unsaturated hydrocarbon having 8 to 20 carbon atoms; R_2 is H or alkyl group having 1 to 3 carbon atoms; X is a metal selected from the group consisting of Na and K, or an amine selected from the group consisting of NH_3 and $NH_2C_2H_4OH$; the amount of said metal salt and/or amine salt of N-acyl sarcosine being in a range of from 0.02 to 10 wt. % of the total amount of said water-based ink composition; said sarcosine compound functioning as a lubricant in the composition for the purpose of acting as a lubricant between a ball seat and the ball of a ball point pen to reduce the wear thereof when said water-based ink composition is used in a ball point pen.

5,062,891

METALLIC INKS FOR CO-SINTERING PROCESS

William C. Gruber, Arlington, and Eric A. Barringer, Waltham, both of Mass., assignors to Ceramics Process Systems Corporation, Milford, Mass.

Filed Aug. 13, 1987, Ser. No. 85,077
Int. Cl.[5] C09D *11/00*
U.S. Cl. 106—20 31 Claims

1. A metallic ink consisting essentially of:

(a) powdered metal particles selected from the group consisting of copper, silver, palladium, gold, alloys thereof, and mixtures thereof;

(b) an organic vehicle system;

(c) a glass component consisting essentially of: (i) 25–57 wt. % alkaline earth oxides, of which MgO comprises 0–50 wt. % and of which CaO comprises 50–100 wt. %; (ii) 23–35 wt. % SiO_2; (iii) 25–35 wt. % B_2O_3; and (iv) 0–10 wt. % Al_2O_3; and

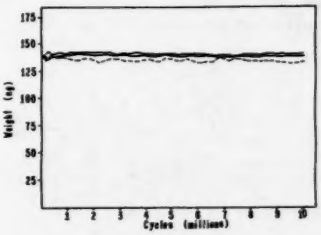
(d) at least one ceramic material selected from the group consisting of: cordierite, forsterite, alumina, quartz, eucryptite, and spodumene.

5,062,892

INK ADDITIVES FOR IMPROVED INK-JET PERFORMANCE

David J. Halko, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 27, 1989, Ser. No. 428,282
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 26 Claims



1. An ink for thermal ink-jet printing comprising a vehicle and an anionic dye, characterized by the presence of at least one oxo anion therein, said at least one oxo anion selected from the group consisting of phosphates, polyphosphates, phosphate esters, arsenate, molybdate, sulfate, sulfite, and oxalate and present in an amount ranging from about 9 mg/L to 14 wt%.

5,062,893

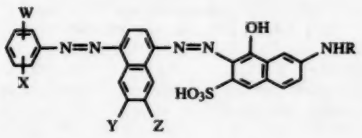
INK FORMULATIONS BY MIXING ANIONIC WATERFAST DYES CONTAINING TWO OR MORE CARBOXYL GROUPS

Raymond J. Adamic; Palitha Wickramanayake; Suraj L. Hindagolla; Garold E. Radke, and David J. Halko, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 22, 1990, Ser. No. 542,862
The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.
Int. Cl.[5] C09D *11/00*
U.S. Cl. 106—22 24 Claims

1. An ink comprising, by wt %:

a) from about 0.5% to about 20% of at least two dyes, each of which, in the free acid state, independently corresponds to the formula



I

wherein
W is COOH,
X is H or COOH,
Y is H, COOH, or SO_3H,
Z is H, COOH, or SO_3H, and
R is H, CH_2COOH, or CH_2CH_2COOH;
provided that there are at least two COOH groups and that the number of COOH groups is equal to or greater than the number of SO_3H groups,

b) up to about 30% of a water soluble organic solvent for said dye, and

c) water.

5,062,894

POLY (ALKYLENE OXIDE)-MODIFIED DIARYLIDE PIGMENT COMPOSITION

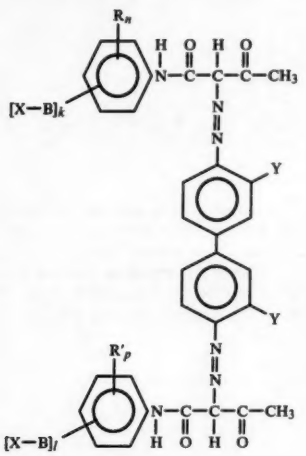
Russell J. Schwartz, Cincinnati; Anthony C. Zwirgzdas, Butler, and Terence R. Chamberlain, Cincinnati, all of Ohio, assignors to Sun Chemical Corporation, Fort Lee, N.J.

Continuation-in-part of Ser. No. 654,162, Feb. 12, 1991. This application Jun. 25, 1991, Ser. No. 720,310

Int. Cl.[5] C09B *31/11*; C09D *11/00*

U.S. Cl. 106—23 19 Claims

1. A diarylide pigment composition comprising:



wherein R and R' are independently selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, and halogen; n and p are independently integers of 0 to 5; Y is selected from the group consisting of chlorine, methyl or methoxy; B comprises a divalent bridging moiety selected from the group consisting of C_1–C_6 alkyl, —$NHSO_2$—, —O—, —CO—, —COO— and —CONH—; X comprises a poly (alkylene oxide) having a number average molecular weight of about 200 to 10,000; and k and l are independently integers of 0 or 1, with the proviso that for at least 50 wt.% of the pigment composition, k and l are both equal to 0, and for at least 3 wt.% of the pigment composition, k and/or l are equal to 1.

5,062,895

CHEMICAL COMPOSITION, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Frank J. Pockrandt, 3337 Michael, Warren, Mich. 48091

Filed Jul. 20, 1989, Ser. No. 382,304

Int. Cl.[5] C09K *3/14, 3/18*; B25B *13/00*; B22F *7/02*

U.S. Cl. 106—36 25 Claims

1. A composition for use in the insertion, removal and retention of fasteners, comprising:

ethylene glycol paste; and

friction particles suspended throughout said paste for providing friction between a tool and a fastener;

said compound comprising a mixture of substantially one-quarter pound of friction particles per substantially one pint of ethylene glycol paste;

said composition being adapted to be applied to engaging surfaces of at least one of said fastener and said tool to prevent stripping of said fastener;

a size of said friction particles being generally in a range between 50 micrometers and 200 micrometers, and said size of said friction particles being specifically determined within said range in dependence on a size of fasteners to be removed.

5,062,896

SOLDER/POLYMER COMPOSITE PASTE AND METHOD

Wu-Song Huang, Poughkeepsie; Igor Y. Khandros, Peekskill; Ravi Saraf, Croton-on-Hudson, and Leathen Shi, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1990, Ser. No. 502,090

Int. Cl.[5] B23K *35/34*

U.S. Cl. 106—287.19 16 Claims

1. A composite polymer-solder paste having a maximum reflow temperature above the melting temperature of a metal alloy powder filler therein and having a rework temperature below said reflow temperature, said paste consisting essentially of at least about 85% by weight of a meltable eutectic metal alloy powder filler which is substantially free of noble metals, a minor amount equal to at least about 6% by weight of a solution of a thermoplastic polymer having a softening temperature which is higher than the melting temperature of said metal alloy powder filler and is below said reflow temperature and which is thermally stable at said maximum reflow temperature, dissolved in a volatile organic solvent having a boiling temperature above the melting temperature of said alloy powder filler and below said reflow temperature, and a lesser amount equal to at least about 0.5% by weight of a transient acidic fluxing agent comprising a metal oxide-reducing agent having a boiling temperature above the melting temperature of said metal alloy powder filler and below said reflow temperature, the reflow of said paste producing an electroconductive solder connection which is substantially free of said fluxing agent and said solvent and which comprises a polymer-reinforced partially coalesced interconnected network of said metal alloy powder, said electroconductive solder connection being reworkable at low remelt temperatures by heating above the softening temperature of said reinforcing polymer but below said maximum reflow temperature.

5,062,897

CARBON FIBER-REINFORCED HYDRAULIC COMPOSITE MATERIAL

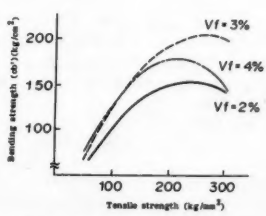
Haruo Katsumata; Hiromichi Sakai; Keisuke Takahashi; Hirofumi Ootaguro; Masashi Matsumoto; Moriyasu Nakamura, all of Kitakyushu, and Tatsuo Ando, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Feb. 16, 1990, Ser. No. 480,768

Claims priority, application Japan, Feb. 17, 1989, 1-38085; Apr. 6, 1989, 1-87679

Int. Cl.[5] C04B *14/00, 7/02, 7/36, 7/14*

U.S. Cl. 106—696 6 Claims



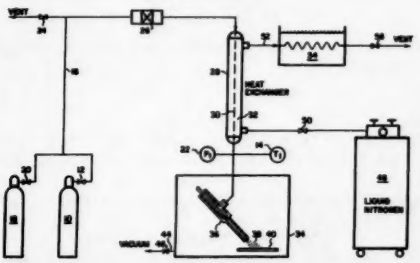
1. A carbon fiber-reinforced hydraulic composite material obtained by mixing and dispersing carbon fibers in a hydraulic material selected from the group consisting of Portland cement, blast furnace cement, alumina cement, calcium silicate, natural gypsum and synthetic gypsum, wherein chopped carbon fibers having a monofilament tensile strength of from 140 kg/mm to 270 kg/mm and a monofilament diameter of from 15 μm to 30 μm are blended as said carbon fibers at a volume fraction of from 1% to 4% of the entire composite material to bring a flow index of said composite material before hardening to 120 mm or above.

5,062,898

SURFACE CLEANING USING A CRYOGENIC AEROSOL

Wayne T. McDermott; Richard C. Ockovic, both of Allentown, Pa.; Jin J. Wu, Ossining; Douglas W. Cooper, Millwood, both of N.Y.; Alexander Schwarz, Allentown, Pa., and Henry L. Wolfe, Pleasant Valley, N.Y., assignors to Air Products and Chemicals, Inc., Allentown, Pa. and International Business Machines Corporation, Yorktown Heights, N.Y.

Filed Jun. 5, 1990, Ser. No. 534,810
Int. Cl.[5] B08B *5/00*
U.S. Cl. 134—7 17 Claims



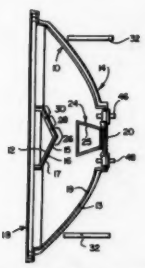
1. A method for removing contaminating particles and/or films from a particle and/or film-containing surface using an impinging stream of an at least substantially solid argon particle-containing aerosol, comprising: expanding a pressurized gaseous argon-containing stream, which is at a temperature above the liquefaction point of argon at the existing stream pressure prior to expansion, forming at least substantially solid particles of argon in said stream by the cooling resulting from said expansion to form an at least substantially solid argon particle-containing aerosol, and directing said aerosol at said surface to remove said contaminating particles and/or film.

5,062,899

WIDE ACCEPTANCE ANGLE, HIGH CONCENTRATION RATIO, OPTICAL COLLECTOR

Mark A. Kruer, Redondo Beach, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 30, 1990, Ser. No. 503,408
Int. Cl.[5] H01L *31/052;* F24J *2/18*
U.S. Cl. 136—259 7 Claims



1. A radiation collector capable of improved collection of off-axis radiation at high concentration ratios, said collector comprising:

a generally concave primary mirror for receiving and reflecting radiation;

means for collecting radiation reflected by said primary mirror;

a secondary mirror aligned coaxially with, and spaced in relation to, said primary mirror for redirecting radiation received from said primary mirror to said radiation collecting means, said secondary mirror having an inner zone, a central zone and an outer zone, said central zone having a hyperboloidal cross sectional configuration which reflects on-axis radiation from the primary mirror to the collecting means, and said inner and outer zones having paraboloidal cross sectional configurations which reflect off-axis radiation from the primary mirror to the collecting means.

5,062,900

PROCESS FOR THE IMPROVEMENT OF THE CORROSION RESISTANCE OF METALLIC MATERIALS

Roger Berneron, Gargenville, and Pierre de Gelis, Saint Germain en Laye, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Paris, France

PCT No. PCT/FR89/00176, § 371 Date Dec. 14, 1989, § 102(e) Date Dec. 14, 1989, PCT Pub. No. WO89/10424, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 18, 1989, Ser. No. 458,743
Claims priority, application France, Apr. 18, 1988, 88 05091
Int. Cl.[5] C23F *15/00*
U.S. Cl. 148—4 13 Claims

1. Process for improving the corrosion resistance of a metallic material, wherein the metallic material is maintained at a temperature of less than about 100° C. while being subjected to a surface treatment by a low temperature plasma, at a pressure of from 1 to 10^3 Pa in an atmosphere comprising at least one gas chosen from the following: oxygen, ozone, nitrogen, hydrogen air, carbon dioxide, carbon monoxide, the nitrogen oxides, water, combustion gases, and mixtures of these with a neutral gas, and wherein said material is the cathode for said treatment.

5,062,901

METHOD OF PRODUCING HARDENED ALUMINUM ALLOY SHEETS HAVING SUPERIOR CORROSION RESISTANCE

Hiroki Tanaka, and Shin Tsuchida, both of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed May 15, 1990, Ser. No. 524,295
Claims priority, application Japan, Aug. 25, 1989, 1-217479
Int. Cl.[5] C21D *8/00;* C22C *21/06*
U.S. Cl. 148—11.5 A 2 Claims

2. In a method of producing a hardened aluminum alloy sheet by casting an aluminum alloy containing 4.0 to 6.0% Mg in a conventional manner, said method comprising a homogenizing step, a hot rolling step, multiple cold rolling steps, at least one intermediate annealing step and a stabilizing treatment step, the improvement comprises: said aluminum alloy being provided as an Al-Mg-Cu alloy containing 0.05 to 0.50% Cu in addition to Mg; and said Al-Mg-Cu alloy being subjected to (1) a final intermediate annealing step comprising heating to temperatures of 350° to 500° C. and rapid cooling to temperatures of 70° C. or less at a cooling rate of 1° C./sec or more; (2) a finishing cold rolling step with a reduction of at least 50%; and (3) coating and baking operations under application of tension, thereby providing a hardened aluminum alloy sheet having a superior corrosion resistance.

5,062,902

FLUXING AGENTS COMPRISING β-DIKETONE AND β-KETOIMINE LIGANDS AND A PROCESS FOR USING THE SAME

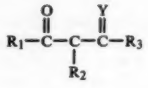
Thomas L. Ellison, San Jose; David A. Roberts, Carlsbad, both of Calif.; John C. Ivankovits, Northampton, and John A. T. Norman, Whitehall, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 502,209, Mar. 30, 1990. This application Dec. 27, 1990, Ser. No. 635,904

Int. Cl.[5] B23K *35/34*

U.S. Cl. 148—23 18 Claims

1. A fluxing agent for soldering comprising an effective amount of a β-diketone or β-ketoimine ligand dispersed in a vehicle wherein the ligand is represented by the formula:

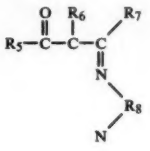


wherein:

R_1 and R_3 are independently selected from a non-fluorinated, partially fluorinated or fully fluorinated linear or branched alkyl or alkenyl group having from 1 to about 8 carbon atoms;

R_2 is a hydrogen atom, a non-fluorinated, partially fluorinated or fully fluorinated linear or branched alkyl or alkenyl group having from 1 to about 8 carbon atoms; and

Y is selected from an oxygen atom; N-R_4 where R_4 is selected from a non-fluorinated, partially fluorinated or fully fluorinated alkyl, aryl, aralkyl or hydroxyalkyl group having from 1 to about 10 carbon atoms; or Y is



wherein

R_5, R_6 and R_7 are independently selected from a non-fluorinated, partially fluorinated or fully fluorinated linear or branched alkyl or alkenyl group having from 1 to about 8 carbon atoms and

R_8 is a non-fluorinated, partially fluorinated or fully fluorinated linear or branched alkylene, alkenylene, phenylene, alkylphenylene or hydroxyalkylene group having from 1 to about 8 carbon atoms.

5,062,903

WELDING PROCESS AND MIXTURE OF REACTANTS FOR USE IN SUCH PROCESS

Denis A. Bronan, Liberty, S.C., and James E. Whetsel, Bedford, Ohio, assignors to Erico Products, Inc,, Cleveland, Ohio

Continuation-in-part of Ser. No. 406,607, Sep. 13, 1989. This application Nov. 30, 1990, Ser. No. 620,137

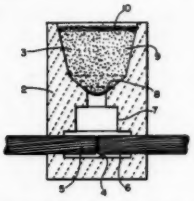
Int. Cl.[5] B23K *35/34*

U.S. Cl. 148—24 13 Claims

1. A process for producing molten weld metal for use in joining at least two metallic pieces comprising:

(A) providing a mixture of reactants comprising a reducing agent, a metallic compound which is exothermically reduced by such reducing agent and a filler metal that does no chemically react with such metallic compound or such reducing agent upon the exothermic reaction of such reducing agent and such metallic compound; and

(B) exothermically reacting such reducing agent and such metallic compound so as to generate sufficient heat to melt such filler metal and form such molten weld metal for joining such metallic pieces, at least 90 percent by weight



of such molten weld metal being formed by such filler metal.

5,062,904

TREATMENT OF FERROMAGNETIC METAL POWDERS AND MAGNETIC RECORDING MEDIA USING THE SAME

Kenichi Yoden, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1990, Ser. No. 592,453

Claims priority, application Japan, Oct. 3, 1989, 1-258514

Int. Cl.[5] H01F *1/02*

U.S. Cl. 148—105 7 Claims

1. A method for treating a ferromagnetic metal powder which comprises forming ferromagnetic metal powder, and then exposing said ferromagnetic metal powder to a low temperature plasma in an oxygen atmosphere.

5,062,905

METHOD OF PRODUCING NON-ORIENTED MAGNETIC STEEL PLATE HAVING HIGH MAGNETIC FLUX DENSITY

Yukio Tomita; Ryota Yamaba, and Tatsuya Kumagai, all of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan, a

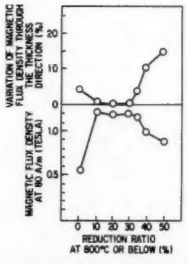
Filed Aug. 14, 1990, Ser. No. 567,142

Claims priority, application Japan, Aug. 18, 1989, 1-212689; Aug. 18, 1989, 1-212690

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.[5] H01F *1/047*

U.S. Cl. 148—111 10 Claims



1. A method of producing non-oriented electrical steel plate having high magnetic flux density comprising the steps of:

preparing a steel slab comprising, by weight, up to 0.01 percent carbon, 0.10 to 3.5 percent silicon, up to 0.20 percent manganese, up to 0.01 percent sulfur, up to 0.05 percent chromium, up to 0.01 percent molybdenum, up to 0.01 percent copper, 0.10 to 3.0 percent aluminium, up to 0.004 percent nitrogen, up to 0.005 percent oxygen and up to 0.0002 percent hydrogen, with the remainder being substantially iron;

reheating the slab to a temperature of 1150° to 1300° C.;

hot-rolling the slab at least once at a rolling shape factor A of at least 0.6 at a finish rolling temperature of at least 900° C. to provide a steel plate having a plate thickness of 50 mm or more;

dehydrogenation heat treating the steel plate at between 600° and 750° C.;

whereby a magnetic flux density of 0.8 tesla or more at a magnetic field of 80 A/m is imparted to the steel;

wherein the hot rolling is accomplished using a rolling mill having a radius R(mm) and wherein the steel plate has an entry-side thickness h_i(mm) and an exit-side plate thickness h_o(mm) which exhibits a relationship with the rolling shape factor A of the hot rolling as follows:

$$A = (2\sqrt{R(h_i - h_o)})/(h_i + h_o).$$

5,062,906

METHOD OF MAKING NON-ORIENTED ELECTRICAL STEEL SHEETS

Akihiko Nishimoto; Yoshihiro Hosoya; Kunikazu Tomita; Toshiaki Urabe, and Masaharu Jitsukawa, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

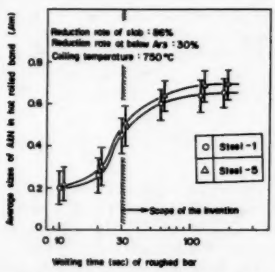
PCT No. PCT/JP89/00242, § 371 Date Oct. 12, 1989, § 102(e) Date Oct. 12, 1989, PCT Pub. No. WO89/08721, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 7, 1989, Ser. No. 427,108

Claims priority, application Japan, Mar. 7, 1988, 63-51785

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—111 **9 Claims**



1. A method of making non-oriented electrical steel sheets, comprising roughing a steel slab immediately after continuously casting thereof to thickness of more than 20 mm at reduction rate of more than 10% without brief soaking at specified temperature range, said steel slab containing C: not more than 0.005 wt %, Si: 0.1 to 1.5 wt %, Mn: 0.1 to 1.0 wt %, P: 0.01 to 0.15 wt %, N: not more than 0.0031 wt %, sol.Al: 0.005 to 0.5 wt %, and S: not more than 0.005 wt %; having a time interval of more than 30 sec at temperature range where the surface temperature of the roughed bar is more than 950° C. till a following finish rolling; performing a finish rolling at not more than Ar_3 and at reduction rate of more than 25 % and coiling at temperature of more than 700° C.

5,062,907

HARD MAGNETIC MATERIAL AND MAGNET MANUFACTURED FROM SUCH HARD MAGNETIC MATERIAL

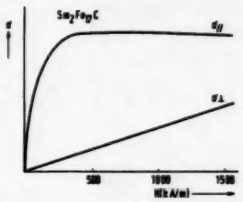
Kurt H. J. Buschow; Dirk B. de Mooij, and Theodora H. Jacobs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed May 4, 1990, Ser. No. 518,900

Claims priority, application Netherlands, May 10, 1989, 8901168

Int. Cl.[5] H01F *1/053*

U.S. Cl. 148—301 **5 Claims**



1. A magnetic material having a magnetic phase comprising crystalline $RE_2.Fe_{17}$, wherein RE is a rare earth metal, having hexagonal crystal structure and interstitial C dissolved in the magnetic phase in a quantity sufficient to provide the magnetic material with a uniaxial magnetic anisotropy at room temperature, and at least 70 at.% of the rare earth metal consists of Sm.

5,062,908

VALVE GUIDE

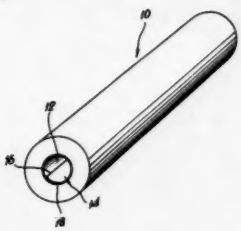
Charles G. Purnell, Coventry, and Andrew R. Baker, Lighthorn, both of England, assignors to Brico Engineering Limited, Coventry, England

Continuation-in-part of Ser. No. 516,703, Apr. 30, 1990. This application Sep. 18, 1990, Ser. No. 584,124

Claims priority, application United Kingdom, Sep. 27, 1989, 8921826

Int. Cl.[5] C22C *38/16*; F01L *3/00*

U.S. Cl. 148—332 **11 Claims**

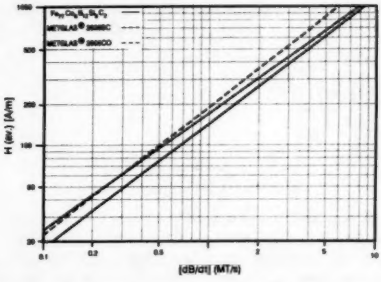


1. A valve guide for an internal combustion engine, said valve guide comprising a tubular component having a bore and having a porous sintered ferrous matrix which is infiltrated over substantially the whole length of the bore of the guide with a copper alloy.

5,062,909
IRON RICH METALLIC GLASSES HAVING SATURATION INDUCTION AND SUPERIOR SOFT FERROMAGNETIC PROPERTIES AT HIGH MAGNETIZATION RATES

V. R. V. Ramanan, Dover, and Carl H. Smith, Chatham, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 379,763, Jul. 14, 1989, abandoned. This application Jun. 13, 1990, Ser. No. 537,221
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—304 7 Claims

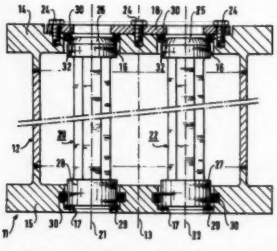


1. A magnetic metallic glass alloy that is at least about 80% glassy, having a composition described by the formula $Fe_aCo_bB_cSi_dC_e$, where "a"–"e" are in atom percent, "a" ranges from about 72 to about 84, "b" ranges from about 2 to about 8, "c" ranges from about 11 to about 16, "d" ranges from about 1 to about 4, and "e" ranges from about 0.5 to about 2, with up to about 1 atom percent of Mn being optionally present in the alloy, said alloy having been annealed, and having saturation induction ranging from about 1.55 T to 1.75 T, magnetic anisotropy energy ranging from about 300 J/m^3 to 400 J/m^3 and a dc swing from negative remanence to positive saturation ranging from about 2.9 T to 3.2 T.

5,062,910
METHOD OF ASSEMBLING A RIGID ELEMENT IN A MODULE, THE ELEMENT HAVING A MEMBRANE FOR SEPARATION, FILTRATION OR CATALYTIC TRANSFORMATION PURPOSES

Daniel Garcera, Tarbes, and Jacques Gillot, Laloubere, both of France, assignors to Societe Des Ceramiques Techiques, Bazet, France

Filed Jan. 26, 1990, Ser. No. 470,456
Claims priority, application France, Jan. 27, 1989, 89 01028
Int. Cl.[5] B30C *39/10*; B32B *18/00*
U.S. Cl. 156—82 17 Claims



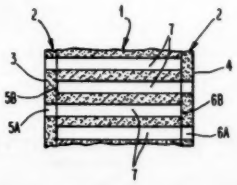
1. In a method of assembling a rigid element in a module, the rigid element having a membrane for separation, filtration, or catalytic transformation purposes and having a substantially cylindrical or prismatic exterior shape, said method comprising forming a support of a sintered material, sealing the ends of said support and depositing an active layer on said support to form said rigid element, and wherein said module contains at least one such rigid element in a substantially cylindrical envelope having an axis parallel to said rigid element and fixed by two end plates having openings and where the ends of element are subsequently fixed to the end plates together with intervening seals, the improvement comprising:

prior to assembling said rigid element in said module depositing an excess thickness on said ends and machining said excess thickness at each end to produce a shoulder whose outside surface has a predetermined circularly-symmetrical shape about an axis substantially coaxial with the axis of said support.

5,062,911
PREPARATION OF CERAMIC HONEYCOMB STRUCTURE HAVING SELECTIVELY SEALED CHANNELS

Leslie E. Hampton, Corning, and David F. Thompson, Painted Post, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 21, 1989, Ser. No. 454,524
Int. Cl.[5] C04B *37/00*
U.S. Cl. 156—89 11 Claims



1. A method for the preparation of a ceramic honeycomb substrate having selectively sealed channels comprising:

(a) providing a dried green ceramic honeycomb body having an inlet face and an outlet face and a plurality of substantially parallel open channels, separated from each other by partition walls, extending through the honeycomb between said faces;

(b) wetting with water the inlet face and the outlet face;

(c) applying a still-wet as formed, substantially flat, green ceramic, cap body against each of said wetted faces to form a substantially integral end cap over each of said faces whereby the channel openings therein are sealed;

(d) exposing the openings of given channels at said inlet face through the end cap thereon and exposing the openings of the remaining channels at said outlet face through the end cap thereon; and

(e) firing said honeycomb body and end caps.

5,062,912
METHOD AND APPARATUS FOR FABRICATING A SEAMLESS HOLLOW RUBBER CORE FOR A BALL

Allan C. Hoffman, 2891 Rumsey Dr., Riverside, Calif. 92506

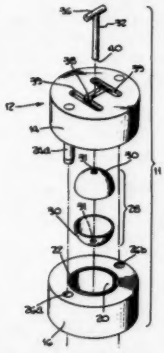
Filed Oct. 15, 1990, Ser. No. 597,892
Int. Cl.[5] B29C *35/52*
U.S. Cl. 156—145 15 Claims

1. A method for fabricating a seamless hollow rubber core for a ball comprising steps of:

providing a mold having a first mold half and a second mold half, each of said first mold half and said second mold half having a hemispherical cavity in opposition to each other such that a spherical cavity is formed when said mold is closed, such spherical cavity being dimensioned commensurately with an outside diameter of said core;

forming a spherical surface from a material which has a melting temperature above a curing temperature of rubber used for said core, said spherical surface being dimen-

sioned commensurately with an inside diameter of said core;
forming a pair of matching core preforms of uncured rubber;
placing said pair of uncured rubber core preforms about said spherical surface to form a core assembly;
mounting said core assembly within said spherical cavity;



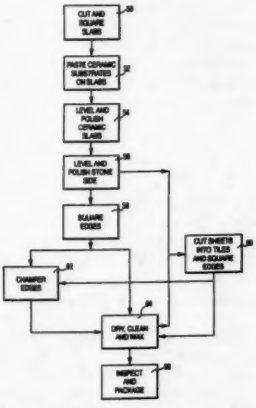
heating said core preforms to said curing temperature for a time sufficient to cure said core preforms, said core being formed during such curing;
heating said core to said melting temperature such that such spherical surface melts whereby molten material remains within said core; and
removing said molten material from said core.

5,062,913

LAMINATED TILE PRODUCT AND METHOD FOR PRODUCING THE SAME

Charles R. Owens, Alexandria, Va., and Luigi Guazzoni, Novara, Italy, assignors to Charles R. Owens, Alexandria, Va.

Continuation-in-part of Ser. No. 177,947, Apr. 5, 1988, Pat. No. 4,931,331. This application Jul. 5, 1989, Ser. No. 375,726
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—154 **15 Claims**


CUT AND SQUARE SLABS
PASTE CERAMIC SUBSTRATES ON SLABS
LEVEL AND POLISH CERAMIC SLABS
LEVEL AND POLISH STONE SIDE
SQUARE EDGES
CHAMFER EDGES
CUT SHEETS INTO TILES AND SQUARE EDGES
DRY, CLEAN AND WAX
INSPECT AND PACKAGE

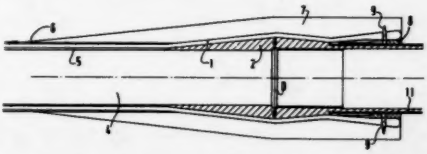
1. A method for producing a laminated tile comprising:
providing a sheet of natural stone having opposed first and second major surfaces;
providing a plurality of ceramic substrates, each of said plurality of ceramic substrates having opposed first and second major surfaces;
providing an adhesive material on at least one of said first major surface of said sheet of natural stone and said first major surface of each of said plurality of ceramic substrates;
assembling said plurality of ceramic substrates and said sheet of natural stone to form a laminated assembly such that said first surface of each of said plurality of ceramic substrates faces said first major surface of said sheet of natural stone with said adhesive material therebetween; and
polishing said second major surface of said sheet of natural stone.

5,062,914

METHOD FOR AFFIXING A METALLIC TIP TO A TUBE MADE OF COMPOSITE WOUND MATERIAL

Jean-François Fuchs, Sainte Helene; Marcel Auberon, Le Haillan; Pierre Odru, Fontenay Sous Bois, and Charles Sparks, Le Vesinet, all of France, assignors to Areospatiale, Paris and Institut Francais du Petrole, Rueil Malmaison, both of, France

Filed Dec. 28, 1989, Ser. No. 458,471
Claims priority, application France, Dec. 29, 1988, 88 17392
Int. Cl.[5] B65H *81/00*; F16C *3/00*
U.S. Cl. 156—172 **10 Claims**



1. Method for affixing a metallic tip to a tube made of composite material, in which a metallic tip which is to be affixed to the tube has an external double-cone shape which includes two conical portions meeting at a central cone base, in which a cone radius decreases with respect to axial distance from the central cone base, comprising the steps of:
arranging the metallic tip adjacent to an end of the mandrel;
continuously winding fibers about said mandrel to form a composite tube, including winding said fibers longitudinally along the mandrel and longitudinally along both conical portions of said metallic tip; and
before completion of said composite tube by polymerization, applying complementary means for circumferentially binding said fibers which are longitudinally arranged for preventing separation of said metallic tip from said composite tube when axial force is applied along said composite tube, said complementary means limiting radial expansion of said composite tube;
wherein said complementary means includes providing a plurality of studs circumferentially distributed along a peripheral portion of said metallic tip, and said step of arranging said complementary means includes the steps of circumferentially winding fibers about the longitudinally arranged fibers forming said composite tube, and in said step of longitudinally winding fibers, further comprising the step of winding the longitudinally arranged fibers about ones of said plurality of studs distributed on said peripheral portion of said metallic tip;
wherein said complementary means includes an externally threaded portion and a ring connected to said externally threaded portion, and wherein each of said plurality of studs are mounted on said ring; and
wherein in said step of longitudinally winding the fibers to form said composite tube, withdrawing said ring prior to polymerization of said composite tube, and providing a nut in threaded engagement on said externally threaded portion until said nut comes in abutment against an end of said metallic tip, and then completing said step of circum-

ferentially winding the fibers such that they are wedged by said nut before completing the polymerization.

5,062,915

LUMBER DOOR AND METHOD FOR MANUFACTURING THEREOF

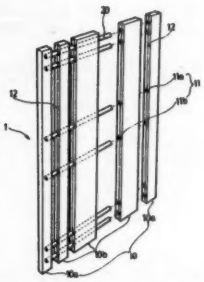
Seok G. Yoon, 563-36, Sinlim 8-Dong, Kwanak-Ku, Seoul, and Jeong Y. Seo, 804-5, Dooryoo 1-Dong, Dalseo-Ku, Daeku, Kyungsangbook-Do, both of Rep. of Korea

Division of Ser. No. 257,860, Oct. 14, 1988, Pat. No. 4,908,990. This application Sep. 11, 1989, Ser. No. 406,898

Claims priority, application Rep. of Korea, Aug. 23, 1988, 10726/1988

Int. Cl.[5] B29C *65/48*

U.S. Cl. 156—252 15 Claims



1. A method of manufacturing a door having two sides, comprising:

forming a number of openings in each of a plurality of lumber pieces;

aligning the pieces such that the openings of one piece align with the openings in another piece;

passing metal pipes through respective aligned openings in the plurality of pieces;

applying an adhesive so that said adhesive passes between said pipes and said pieces when the pipes pass through said openings;

pressing the pieces together and allowing said adhesive to cure so as to secure said pipes and said pieces to each other;

the step of passing the metal pipes through the opening including passing them so that they extend substantially from one side of the door to the other; and

the step of applying the adhesive includes applying an adhesive having means for corroding said pipes so that said pipes grip the pieces.

5,062,916

METHOD FOR THE MANUFACTURE OF ELECTRICAL MEMBRANE PANELS HAVING CIRCUITS ON FLEXIBLE PLASTIC FILMS

Brian E. Aufderheide, Cedarburg; Michael J. Robrecht, Whitefish Bay, and Wayne R. Kelley, Cedar Grove, all of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Aug. 1, 1990, Ser. No. 561,027

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—269 8 Claims

1. A method for manufacturing electrical membrane panels including conductive first and second circuits on spaced surfaces of two plastic films including, in sequence, the steps of:

(1) providing a substrate web of flexible plastic film;

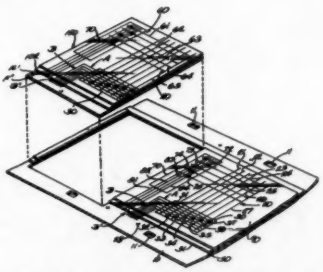
(2) defining a plurality of registration means longitudinally along the substrate web, there being a registration means for each row of circuits to be applied onto the web in subsequent steps;

(3) applying a plurality of spaced apart conductive first circuits along a first surface of the substrate web by aligning with the registration means during application thereof,

(a) the first circuits being arranged in rows and columns along the first surface of the substrate web, with at least one column thereof and at least one first circuit in each row,

(b) each first circuit comprising a plurality of conductive first traces and first leads, and each first lead including a connection end portion;

(4) laminating a second web of flexible plastic film to the substrate web by aligning a longitudinal edge of the second web relative to the first circuits to cover the first circuits except for the connection end portions of each first lead;



(5) applying a plurality of spaced apart conductive second circuits along the first surface of the second web by aligning with the registration means during application thereof,

(a) there being a second circuit registered with each first circuit;

(b) each second circuit comprising a plurality of conductive second traces arranged in selected registration with the first traces of a first circuit, and a plurality of second leads each including a connection end portion;

thereby forming a plurality of membrane panels each including a first circuit and a second circuit with the connection end portions of the first leads exposed along the substrate web and the connection end portions of the second leads exposed along the second web.

5,062,917

SUPPORT ELEMENT FOR THE FOLLOWERS OF A CAM DRIVE OF A DRIVE MECHANISM AND A LABELLING STATION EQUIPPED WITH A SUPPORT ELEMENT

Rudolf Zodrow, Düsseldorf, Fed. Rep. of Germany, assignor to ETI-TEC Maschinenbau GmbH, Erkrath, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 335,025

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1988, 3811868; Feb. 8, 1989, 3903676

Int. Cl.[5] F16H *55/14*

U.S. Cl. 156—568 17 Claims

1. Support element for cam followers comprising:

an outer body member having at least one radially inwardly projecting claw;

said outer body member for the mounting of a cam follower thereon;

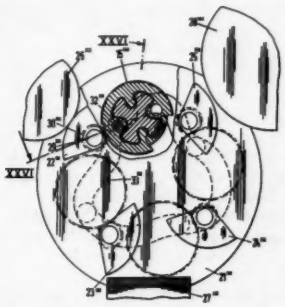
an inner body member for being operatively associated with said outer body member;

said inner body member having first and second radially outwardly projecting claws corresponding to said at least one radially inwardly projecting claw of said outer body member;

said inner body member and said outer body member being out of direct contact with one another;

dampening means for being interposed between and in direct contact with said outer body member and said inner body member;

said dampening means being an elastic material;
said first and second radially outwardly projecting claws of said inner body member being relatively positioned to define a cavity therebetween;
said at least one radially inwardly projecting claw of said outer body member being positioned within said cavity and between said first and second radially outwardly projecting claws of said inner body member;



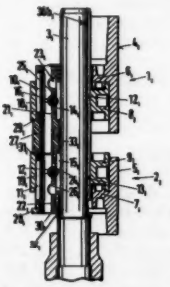
said elastic material for absorbing at least radial forces between said inner body member and said outer body member to dampen noise applied to said outer body member before the noise reaches said inner body member; and
said outer body member and said inner body member defining a plurality of radial recesses which are filled with a slug of elastic material.

5,062,918

GLUE SEGMENTS WHICH CAN BE ATTACHABLE TO A DRIVE SHAFT OF A LABELLING MACHINE

Rudolf Zodrow, Düsseldorf, Fed. Rep. of Germany, assignor to ETI-TEC Maschinenbau GmbH, Erkrath, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 335,478, Apr. 7, 1989. This application Nov. 3, 1989, Ser. No. 432,113
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837362
Int. Cl.[5] B65C *9/26*
U.S. Cl. 156—578 **18 Claims**



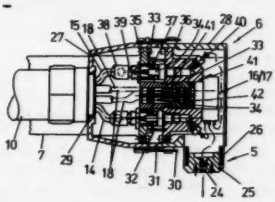
1. A labelling machine for bottles, or the like, including a rotatable drive shaft, the drive shaft having an axis of rotation, the drive shaft including at least one radially extending surface means disposed at a predetermined location axially on the drive shaft, said labelling machine comprising;
at least one glue segment having a curved glue take-up surface;
said at least one glue segment including a hole for receipt of the drive shaft within said hole;
said at least one glue segment for being disposed on the drive shaft with the drive shaft being disposed within said hole
said at least one glue segment being for rotation with the drive shaft;
said at least one glue segment including an axial bore:
said axial bore including a longitudinal axis;
said hole including a longitudinal axis;
said longitudinal axis of said bore being substantially parallel with said longitudinal axis of said hole and with the axis of the drive shaft when the drive shaft is disposed within said hole;
a bushing including a base element and a spacing element:
said base element of said bushing for being disposed in said bore of said at least one glue segment;
said spacing element of said bushing for extending outwardly from said bore in an axial direction, along said longitudinal axis of said bore, toward one of the at least one radially extending surface means;
said spacing element including abutting surface means for making contact with the one of the at least one radially extending surface means; and
said abutting surface means making contact with the one of the at least one radially extending surface means for defining an axial position of said at least one glue segment relative to the predetermined location of the one of the at least one radially extending surface means of the drive shaft.

5,062,919

METHOD AND AN APPARATUS FOR BONDING TOGETHER AT LEAST TWO RUNNING LENGTHS OF MATERIAL

Malcolm McPherson, Poole-Dorset, United Kingdom, and Reinhold Ernest, Stadtbergen, Fed. Rep. of Germany, assignors to Grafotec Kotterer GmbH, Diedorf, Fed. Rep. of Germany

Division of Ser. No. 247,341, Sep. 21, 1988, Pat. No. 4,952,267. This application Apr. 16, 1990, Ser. No. 509,235
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735856; Nov. 26, 1987, 3740045
Int. Cl.[5] B05B *1/00*
U.S. Cl. 156—356 **6 Claims**



1. An apparatus for applying at least one liquid strip to an endless web to aid in creasing the web, comprising:
a holder;
a supply cord through which at least one liquid supply line and control line means extend, said at least one liquid supply line having a check valve at one end; and
at least one feed head mounted to said holder, to which said supply cord is attached so that said at least one liquid supply line and said control line means extend into said at least one feed head, said at least one feed head including a nozzle, control valve means for controlling said nozzle and said at least one liquid supply line, coupling means including a setting member associated with each check valve, and detachably joined first and second halves defining a parting plane, wherein:
said first half being detachably mounted to said holder and having an inlet opening for receiving said supply cord,
said nozzle and control valve means being situated in said second half; and
said coupling means being situated partly in said first half

and partly in said second half adjacent the parting plane such that when the two halves are joined together said control line means is coupled by said coupling means to said control valve means for controlling said control valve means, said at least one liquid supply line is sealingly coupled by said coupling means for control by said control valve means and such that the check valve of said at least one liquid supply line is maintained open by its associated setting member.

5,062,920

APPARATUS FOR MAKING A TIGHTLY CLOSED LOOP OF A TAPE OF THERMOPLASTIC MATERIAL AROUND AN OBJECT

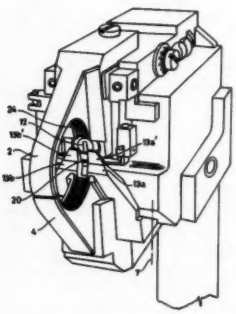
Cornelis M. Horikx, Brummen, and Martinus J. Jaspers, Nuenen, both of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Filed May 21, 1990, Ser. No. 526,368

Claims priority, application Netherlands, May 25, 1989, 8901314

Int. Cl.[5] B32B *31/24*; B65B *13/00*

U.S. Cl. 156—380.4 **3 Claims**



1. An apparatus for fixing a tightly closed loop of a tape of thermoplastic material around an object, comprising:

a. two jaws that can be moved relative to each other between an open and a closed, object-enclosing position, each having an inner tape guide channel along its inner periphery;

b. a first welding member comprising an electrode connected to a cavity resonator connected to a microwave generator with a frequency of at least 433 MHz;

c. a second welding member comprising a counter electrode connected to said cavity resonator positioned at a distance from said first welding member not greater than about three times the thickness of said tape, an electrical field intensity being generated between the first welding member and the second welding member by the microwave generator during operation of the apparatus;

d. means for the relative movement of the welding members to enable an open position when the tape is being positioned around the object, and a closed position when welding of the tape may be effected, said welding members being positioned with respect to said jaws so that the tape in the inner tape guide channel of said jaws will pass between the first and second welding members while the welding members are in the closed position;

e. means for passing the tape through the guide channel in the jaws in circumferential direction until its free end, after making at least one complete loop, is positioned between the welding members; and

f. means for clamping the free end of the tape and for subsequently pulling back the tape, such that a tight loop is made around the object and there is formed between the welding members a welding point where at least two different sections of the tape overlap, said means for clamping the free end of the tape being separate from said first welding member and said second welding member, being positioned in advance of the welding point with respect to the direction in which the tape is fed and comprising a first clamp provided with a first gripping surface that can be pivoted about a pivot pin which is transverse to the tape feeding direction and a second clamp comprising two parts that can be moved relative to each other to an operating position and an open position and are each provided with gripping surfaces, which parts in cooperation with the first gripping surface clamp the tape between them in the operating position and allow it to be passed through in the open position.

5,062,921

METHOD FOR REGULATING THE FEED OR COMBUSTION CONDITIONS OF CONCENTRATED WASTE LIQUORS IN A SODA RECOVERY UNIT

Paavo Hyoty, and Erik Saiha, both of Tampere, Finland, assignors to Oy Tampella Ab, Tampere, Finland

Filed Mar. 29, 1990, Ser. No. 500,951

Claims priority, application Finland, Mar. 31, 1989, 891574

Int. Cl.[5] D21C *11/12*

U.S. Cl. 162—31 **7 Claims**

1. A method for recovering heat and salts for preparation of cooking liquor from a feedstock of waste liquor produced in pulping of wood chips, including concentrating the feedstock of waste liquor to 28–40 percent water, spraying the concentrated waste liquor through a nozzle at the top of a soda recovery unit which has a porous pile containing pyrolysed liquor in a lower high temperature reducing zone thereof, and burning the sprayed droplets of concentrated waste liquor as they fall through the soda recovery unit from the nozzle to an upper surface of the pile whereby the droplets lose water to a flue gas stream which is taken off from the soda recovery unit and puff up into particles having a diameter larger than the diameter of the droplets emanating from the nozzle,

the improvement comprising:

(a) measuring the ratio of lignin to at least one carboxylic acid present in said concentrated waste liquor while measuring the ratio of droplet diameter to particle diameter;

(b) correlating said ratio of lignin to carboxylic acid with said ratio of droplet diameter to particle diameter;

(c) monitoring the ratio of lignin to at least one carboxylic acid present in said concentrated waste liquor and using the correlation obtained in step (b) to indirectly monitor said ratio of droplet diameter to particle diameter; and

(d) regulating a processing condition including at least one of a feed condition of the waste liquor and a combustion condition in the soda recovery unit in response to said monitored ratio of lignin to at least one carboxylic acid present in said concentrated waste liquor.

5,062,922

SIZING PAPER WITH α-HYDROXYCARBOXYLIC ACID

Masato Nakajima; Kenji Yokotani, both of Hirakata, and Atsushi Ikeda, Osaka, all of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 180,922, Apr. 13, 1988, abandoned. This application Sep. 22, 1989, Ser. No. 411,123

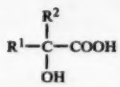
Claims priority, application Japan, Dec. 24, 1987, 62-327932

Int. Cl.[5] D21H *17/14*

U.S. Cl. 162—158 **12 Claims**

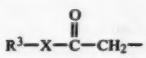
1. A method for sizing paper which comprises mixing a pulp slurry with a sizing agent comprising an aqueous dispersion having a solids content of 0.5 to 70% by weight, said solids comprising 80–99% by weight of an α-hydroxycarboxylic acid, or a salt thereof, and 20–1% by weight of an emulsifier, to form a mixture containing 0.1 to 1.0% of said solids based on the weight of the pulp, and preparing paper from the mixture;

said α-hydroxycarboxylic acid having the formula (I)



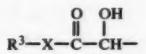
(I)

wherein R^1 is an alkyl group having 8 to 30 carbon atoms, an alkenyl group having 8 to 30 carbon atoms, a group having the formula (IIa):



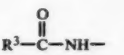
(IIa)

in which R^3 is an alkyl group having 8 to 30 carbon atoms or an alkenyl group having 8 to 30 carbon atoms and X is an oxygen atom or —NH—, a group having the formula (IIb):



(IIb)

in which R^3 and X are as defined above; or a group having the formula (IIc):



(IIc)

in which R^3, is as defined above; and R^2 is a hydrogen atom, an alkyl group having 1 to 30 carbon atoms or an alkenyl group having 1 to 30 carbon atoms.

5,062,923

ROPE SYSTEM FOR A PAPER MACHINE COATING OR SIZE PRESS SECTION

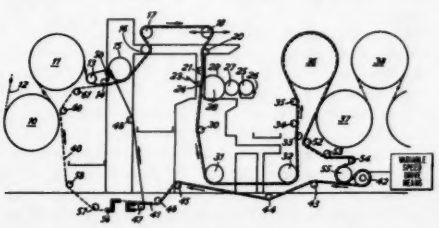
Leslie Morgan, Pendoylan, Great Britain, assignor to The Wiggins Teape Group Limited, Baskingstoke, England

Continuation of Ser. No. 321,314, Mar. 10, 1989, abandoned. This application Jul. 13, 1990, Ser. No. 552,849

Claims priority, application United Kingdom, Mar. 11, 1988, 8805786

Int. Cl.[5] D21F *7/02*

U.S. Cl. 162—265 **5 Claims**



1. In a papermachine, an on-line coating section or size press section thereof comprising a rope system, wherein the papermachine includes a drive means for driving the coating section or size press section and a drive means for driving the rope system and wherein the drive means for the rope system for the section is independent from the other drive means and is structured and arranged for driving the ropes at variable speeds and to provide a driving capacity such that during simultaneous operation of both drive means the drive means of the rope system can operate at speeds greater than the other drive means.

5,062,924

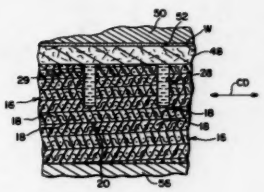
BLANKET FOR AN EXTENDED NIP PRESS WITH ANISOTROPIC WOVEN BASE LAYERS

Paul McCarten, Scranton, and Eugene Slagowski, Waverley, both of Pa., assignors to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 179,086, Apr. 8, 1988, Pat. No. 4,944,820. This application Jul. 31, 1990, Ser. No. 560,402

Int. Cl.[5] D21F *3/02*; B32B *3/30*

U.S. Cl. 162—358 **15 Claims**



1. A looped non-porous blanket for an extended nip press, said blanket comprising:

a woven base;

said base including:

a first plurality of filaments disposed in a machine direction, said first plurality of filaments having a modulus of elasticity which permits flexing of the blanket during movement of the blanket through the extended nip press;

a second plurality of filaments woven together with said first plurality of filaments and disposed in a cross-machine direction, said second plurality of filaments having a modulus of elasticity which is higher than the modulus of elasticity of said first plurality of filaments for inhibiting flexing of the blanket in a cross-machine direction;

thermo-setting resin applied to said base such that said resin is reinforced by said base; and

said resin defining a plurality of vents for permitting the escape of water in the liquid and vapor phase away from the extended nip press during use thereof, said second plurality of filaments preventing collapse of said vents during use of the extended nip press due to said higher modulus of elasticity; said belt being structured and arranged such that in cross section multiple thicknesses of the woven base applied with resin are located in land areas of the blanket between the vents.

5,062,925

METHOD OF REDUCING THE NITROGEN DIOXIDE CONTENT OF FLUE GAS FROM A COKE OVEN WITH DUAL HEATING FLUES BY A COMBINATION OF EXTERNAL FLUE GAS FEED BACK AND INTERNAL FLUE GAS RECIRCULATION

Heinz Dürselen, Velbert; Arnulf Schüffler, and Günter Meyer, both of Essen, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 4, 1989, Ser. No. 445,748

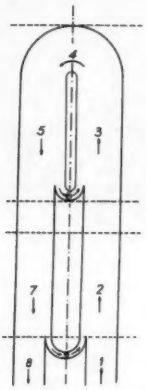
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841630

Int. Cl.[5] C10B *21/18*

U.S. Cl. 201—41 **5 Claims**

1. In a method of reducing a nitrogen oxides content of a flue gas generated on firing of a rich gas or combination coke oven, said coke oven having a plurality of heating walls forming dual heating flues, in which a single stage or multistage combustion takes place, and said coke oven also having a plurality of regenerators for recovery of flue gas heat and preheating of an underfiring medium, the improvement comprising the steps of mixing one portion of said flue gas drawn from one flue of said dual heating flues with said underfiring medium not after admission to the other flue of said dual heating flues, recirculat-

ing another portion of said flue gas additionally inside said dual heating flues, recirculating externally at a predetermined flow rate said one portion of said flue gas and controlling said recirculating externally said one portion of said flue gas so that a flame temperature in said heating flues is kept constant based



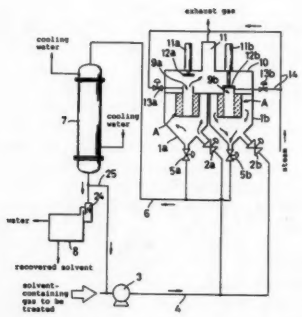
on a heat balance in said heating flues, and feeding, during rich gas firing of said coke oven, said one portion of said flue gas recirculated externally only to those of said regenerators, which receive said underfiring media during lean gas operation, and, during rich gas operation, only to every second one of said regenerators.

5,062,926

SOLVENT RECOVERY APPARATUS

Takeshi Maeda, Kobe; Hiroshi Kawaguchi, Ibaraki; Harukazu Yamaguchi, Izumi; Hitoshi Sakai, Tokyo; Akio Ando, Yokohama; Yasuo Matsushita, and Tetsuya Takemoto, both of Osaka, all of Japan, assignors to Osaka Gas Limited, Osaka and Asahi Seisakusho Company Limited, Tokyo, both of, Japan

Filed Sep. 28, 1990, Ser. No. 589,518
Claims priority, application Japan, Oct. 9, 1989, 1-118435[U]
Int. Cl.[5] B01D *53/14*
U.S. Cl. 202—183 **16 Claims**



1. A solvent recovery apparatus including:

an adsorption tower having a gas adsorption element and an openable exhaust portion;

a gas supply pipe connected to the tower for supplying a solvent-containing gas to be treated to said tower;

a steam supply pipe connected to the tower for supplying steam to said tower to heat said adsorption element for solvent removal, the steam carrying away the solvent from the adsorption element;

a solvent recovery pipe connected to the tower for carrying from said tower the steam and the removed solvent carried therein;

a condenser connected to said solvent recovery pipe for cooling and liquefying the steam and the solvent carried therein to form a liquid mixture and discharging the liquid mixture;

a specific-gravity separating unit for receiving the discharged liquid mixture downstream of the condenser and separating the liquid mixture by specific gravity, thereby to recover a liquefied solvent, said condenser having an output for discharging the liquid mixture to said separating unit; and

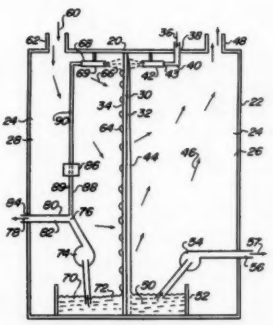
blocking means, for preventing a transmission of gas pressure from said tower to said separating unit.

5,062,927

METHOD OF OPERATING A STILL

Timothy R. Stout, Placerville, Calif., assignor to T and G Technologies, Inc., Placerville, Calif.

Filed Jan. 5, 1990, Ser. No. 461,246
Int. Cl.[5] B01D *1/22, 3/28, 61/00*
U.S. Cl. 203—89 **7 Claims**



1. A method of condensing a vapor of a distilland on a surface of a membrane that includes a portion which is substantially vertically oriented and that is substantially unwettable by, and impervious to, the distilland, the method comprising the steps of:

supplying vapor of the distilland to the surface of the membrane;

transferring heat from the vapor at the surface of the membrane to condense droplets of the distilland thereon; and

supplying droplets of a washing liquid to an upper portion of the surface of the membrane at substantially the same temperature as the condensed droplets of the distilland to promote the accumulation of condensed droplets of the distilland in response to gravity-induced downward flow of washing liquid and condensed droplets along the surface.

7. A method of condensing a vapor of a distilland on a surface of a membrane that includes a portion which is substantially vertically oriented and that is substantially unwettable by, and impervious to, the distilland, the method comprising the steps of:

adding surfactant to the distilland of which vapor is to be condensed;

supplying the distilland and surfactant substantially as a continuous film on a surface of the membrane to receive heat transferred therethrough from an opposite surface of the membrane on which vapor of the distilland condenses;

supplying vapor of the distilland to the opposite surface of the membrane that is substantially unwettable;

transferring heat from the vapor at the opposite surface of the membrane to condense droplets of the distilland thereon; and

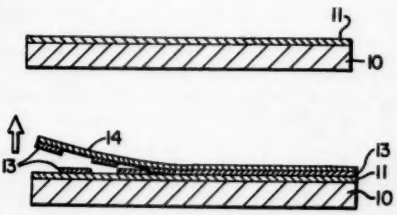
supplying droplets of a washing liquid to an upper portion of the opposite surface of the membrane at substantially the same temperature as the condensed droplets of the distilland to promote the accumulation of condensed droplets of the distilland in response to gravity-induced downward flow of washing liquid and condensed droplets along the opposite surface.

5,062,928

PROCESS FOR PRODUCING COLOR CHANGE DEVICES INCORPORATING LATENT INDICIA AND THE RESULTING DEVICES

Gary J. Smith, Glenburnie, Canada, assignor to Alcan International Limited, Quebec, Canada

Filed Apr. 17, 1990, Ser. No. 510,175
Int. Cl.[5] C25D *11/34*
U.S. Cl. 204—15 **16 Claims**



1. In a process for producing colour change devices incorporating latent indicia by anodizing a colour-generating metal, having limited surface areas thereof covered by a mask, in the presence of a fluoride as an adhesion-reducing agent in order to produce a colour-generating laminate incorporating an anodic film having detachable and non-detachable areas, and adhering a transparent or translucent sheet onto said anoidic oxide film to facilitate detachment of parts of said film from said colour generating metal, the improvement which comprises forming said mask from a masking material which permits anodization of areas of said surface covered by said mask while preventing said adhesion-reducing agent from exerting a substantial adhesion-reducing effect in said areas of said surface covered by said mask, and forming an anodic film having detachable and nondetachable areas by means of a single anodization step carried out in the presence of said adhesion-reducing agent.

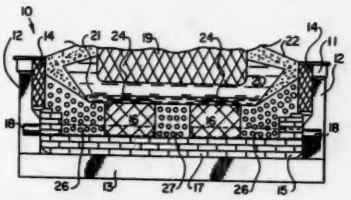
5,062,929

LININGS FOR ALUMINUM REDUCTION CELLS

Tom J. Hudson, Beaconsfield; John McIntyre, Kingston; Pierre Tremblay, Chicoutimi; Claude Allaire, Quebec, and Bohdan Gayra, Kingston, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 218,834, Jul. 13, 1988, Pat. No. 4,877,507, which is a continuation-in-part of Ser. No. 138,503, Dec. 24, 1987, abandoned. This application Aug. 11, 1989, Ser. No. 393,966
Claims priority, application Canada, Jul. 14, 1987, 542053; Aug. 28, 1987, 545660
The portion of the term of this patent subsequent to Oct. 31, 2005, has been disclaimed.
Int. Cl.[5] C25C *3/06, 3/08*
U.S. Cl. 204—67 **7 Claims**

7. A method of producing aluminum in an aluminum electrolytic cell having a cell floor and cell walls for containing liquid cell components comprising an electrolyte and molten aluminum as a single discrete layer beneath the electrolyte, a lining for said cell floor having an upper surface which is generally flat beneath said layer of molten aluminum, a lining for said cell walls and one or more anodes capable of dipping into said liquid electrolyte from above and each having an anode surface spaced from but confronting said cell floor lining, said cell floor lining comprising a region made of solid electrically conductive material extending upwardly to said upper surface, and at least one region made of a solid refractory non-carbonaceous electrically non-conductive alumina-containing material extending upwardly to said upper surface between the electrically conductive material and the cell wall lining, and at least one current collector bar extending from outside the cell into



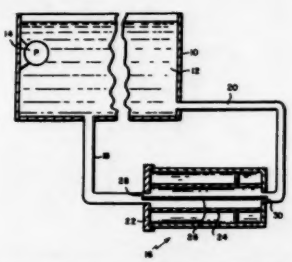
said cell floor lining beneath said upper surface and forming electrically conductive contact with said solid electrically conductive material while being substantially surrounded by said non-conductive material in at least one region; said method comprising charging said cell with an electrolyte comprising a cryolite-alumina mixture, dipping said anodes into said electrolyte, passing a suitable electrical current through said cell between said anodes and said solid electrically conductive material of said cell floor lining, and tapping aluminum from said cell when a sufficient quantity of aluminum has formed on said cell floor lining.

5,062,930

ELECTROLYTIC PERMANGANATE GENERATION

John R. Dillon, Warwickshire, and James D. O'Connor, Coventry, both of England, assignors to Shipley Company Inc., Newton, Mass.

Filed Jul. 24, 1990, Ser. No. 557,623
Int. Cl.[5] C25B *1/28*
U.S. Cl. 204—82 **16 Claims**



1. A process for permanganate generation by electrolytic oxidization of one or more manganese compounds in a solution, comprising the steps of:

(a) contacting an anode and a cathode with the solution, the cathode having a surface deposit being adherent to manganese dioxide during electrolysis of the solution; and

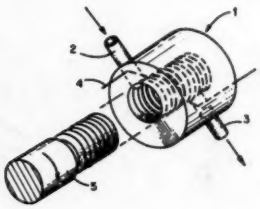
(b) subjecting the solution to electrolysis.

5,062,931

ELECTROCHEMICAL POLISHING OF THREAD FASTENER TEST SPECIMENS OF NICKEL-CHROMIUM IRON ALLOYS

Alan R. Kephart, Scotia, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 3, 1990, Ser. No. 547,370
Int. Cl.[5] B23H *3/10*; C25F *3/16*
U.S. Cl. 204—129.7 7 Claims



5. A method for electrochemically polishing machined metal surfaces of a threaded fastener to produce a surface from which surface machining-induced residual stresses and distressed metal have been removed, which comprises:

a) juxtaposing a the root surface of the threaded portion of said threaded fastener from which metal is to be removed in a sealed electrolyte flow path within an electrical insulating body with a nickel-chromium alloy cathode partly protruding therefrom; and

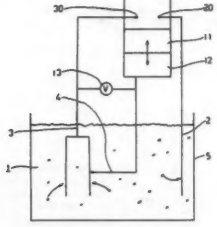
b) flowing an aqueous solution of sulfuric acid and nitric acid through said flow path and across the site of metal removal on a test specimen acting as an anode to flush out the metal's dissolution products and produce said electrochemically polished surface.

5,062,932

PROCEDURE AND MEANS FOR SEPARATING PLASTIC PARTICLES ELECTRICALLY FROM SOLUTIONS, IN PARTICULAR FROM CELLULOSE AND PAPER FIBRE SOLUTIONS

Martti Pulliainen, Anttola; Hannu Savisalo, Mikkeli, both of Finland, and Markku Ainali, Västerås, Sweden, assignors to Savcor-Consulting Oy, Finland

Filed Apr. 3, 1990, Ser. No. 504,554
Int. Cl.[5] C02F *1/46*
U.S. Cl. 204—130 13 Claims



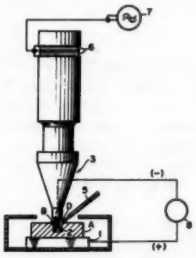
1. Method of separating plastic particles from a liquid medium in which the same are distributed, which comprises subjecting said liquid medium containing said plastic particles in a container provided with an anode, a cathode and a reference electrode to electrolytic separation by controlling the potential of the anode and the cathode such that the potential of the anode is at most 2800 mV S.C.V., or the potential of the cathode is at least −3500 mV S.C.V.

5,062,933

ULTRASONIC MACHINING METHOD

Akio Nakano, 14-1, Ichikawaminami 3-chome, Ichikawa-shi, Chiba-ken, Japan

Filed Oct. 31, 1989, Ser. No. 430,279
Claims priority, application Japan, May 19, 1989, 1-124196
Int. Cl.[5] B23H *3/08, 3/10*
U.S. Cl. 204—129.46 3 Claims



1. An ultrasonic machining method, comprising the steps of:

arranging a tool adjacent to a workpiece having a work surface, with a gap of a predetermined distance between said work surface and said tool;

supplying an electrolyte having spherical soft abrasive grains suspended therein, to the gap between the work surface and the tool;

applying an electric current across the workpiece and the tool; and

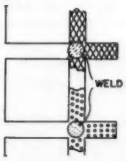
ultrasonically vibrating said tool such that said grains are ultrasonically vibrated and such that the grains remove a film formed on the work surface of the workpiece by electrolysis, with the removed film being discharged from said gap during machining.

5,062,934

METHOD AND APPARATUS FOR CATHODIC PROTECTION

Gian L. Mussinelli, Como, Italy, assignor to Oronzio deNora S.A., Bioggio, Switzerland

Filed Dec. 18, 1989, Ser. No. 452,561
Int. Cl.[5] C23F *13/00*
U.S. Cl. 204—147 20 Claims



1. A grid electrode for cathodic protection of steel reinforced concrete structures comprising a plurality of valve metal strips each with an electrocatalytic surface, each of said strips having voids and nodes, said nodes being 2,000 to 7,000 nodes per square meter, said strips being connected together to form the grid.

5,062,935

METHOD OF VAPORIZING A SAMPLE SUBSTANCE

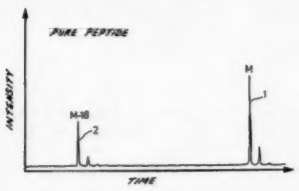
Edward W. Schlag, Garching; Josef Lindner, Munich; Ronald C. Beavis, Landshut, and Jurgen Grotemeyer, Freising, all of Fed. Rep. of Germany, assignors to Bruker-Franzen Analytik GmbH, Bremen, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,763

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809504

Int. Cl.[5] G01N *27/62;* B23K *26/00*

U.S. Cl. 204—157.41 20 Claims



1. Method of vaporizing a sample substance consisting of molecules, wherein the sample substance is exposed to high-energy laser beam pulses so that the molecules at the surface of the sample substance are desorbed by the energy of the laser beam pulses to produce neutral molecules, characterized by the steps of mixing the sample substance, prior to its irradiation, with a matrix material which is easily decomposed under the influence of the laser beam pulses so that the sample substance is embedded in the matrix material and exposing the mixture comprising the sample substance and the matrix material to the laser beam pulses.

5,062,936

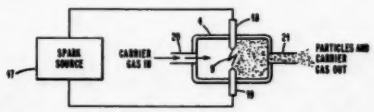
METHOD AND APPARATUS FOR MANUFACTURING ULTRAFINE PARTICLES

John S. Beaty, Belmont, and Jonathan L. Rolfe, North Easton, both of Mass., assignors to Thermo Electron Technologies Corporation, Waltham, Mass.

Filed Jul. 12, 1989, Ser. No. 378,845

Int. Cl.[5] H05A *3/00*

U.S. Cl. 204—164 3 Claims



1. The method of manufacturing non-vaporized ultrafine particles comprising:

providing two electrodes each containing a conductive material;

mounting said electrodes in spaced-apart relationship in a reaction chamber;

repetitively producing, at a frequency of between about 120 and 5000 pulses per second, a spark between the electrodes sufficient to cause non-vaporizing ablation of at least one of the electrodes and formation of ultrafine particles; and,

carrying said ablated material away from the reaction chamber in a carrier gas.

5,062,937

PROCESS FOR PREPARING AN INK JET HEAD

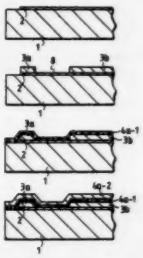
Hirokazu Komuro, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,056

Claims priority, application Japan, Dec. 2, 1987, 62-303264; Dec. 2, 1987, 62-303265; Dec. 2, 1987, 62-303266

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.15 16 Claims



1. A process for preparing an ink jet head having a support, an electrothermal transducer provided on the support and having a heat-generating resistor and a pair of electrodes electrically connected to the heat-generating resistor, a first upper layer provided on the electrothermal transducer, a second upper layer provided on the first upper layer and a liquid path communicated with a discharge opening for discharging liquid and formed on the support so as to correspond to the heat-generating resistor portion of the electrothermal transducer formed between the pair of electrodes, wherein the method comprises the steps of:

forming the first upper layer using a bias sputtering method, wherein the absolute value of the bias voltage is 50 V or less and greater than 0 V; and

forming the second upper layer using the bias sputtering method, wherein the absolute value of the bias voltage is higher than 50 V.

5,062,938

HIGH COERCIVITY LOW NOISE COBALT ALLOY MAGNETIC RECORDING MEDIUM AND ITS MANUFACTURING PROCESS

James K. Howard, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

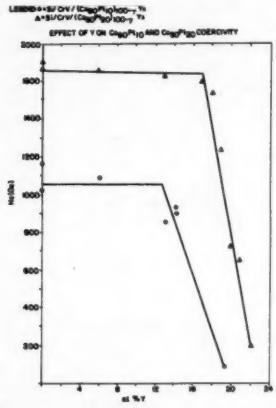
Filed Jan. 16, 1990, Ser. No. 464,842

Int. Cl.[5] G11B *23/00*

U.S. Cl. 204—192.2 2 Claims

1. In a process for the fabrication of a thin film disk for horizontal magnetic recording, the disk being of the type having a magnetic layer comprising a cobalt alloy, wherein the magnetic layer is formed by sputter deposition, an improvement comprising the steps of (a) during the sputter deposition of the cobalt alloy elements, sputter depositing an impurity

element selected from the group consisting of Y, Si, the rare earth elements, Hf, Ge, Sn and Zr, and (b) thereafter exposing



the sputter deposited magnetic layer to oxygen to form an oxide of the impurity element in the magnetic layer.

5,062,939

SELECTIVE METALLIZATION OF CARBONYL-CONTAINING POLYMER FILMS

Charles M. Roland, Waldorf, Md., and Mark F. Sonnenschein, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1990, Ser. No. 500,979

Int. Cl.[5] B05D *3/06, 5/12;* **C23C** *16/00, 14/00*

U.S. Cl. 204—192.17 **11 Claims**

1. A method of selectively metallizing a carbonyl-containing polymer, comprising the steps of:

(a) contacting a surface of a carbonyl-containing polymer with a layer or film of a metal to be selectively deposited thereon;

(b) exposing a selected area on the surface of said polymer to infrared radiation of a wavelength absorbed by said polymer and having sufficient power to significantly increase the flexibility of said polymer in said exposed area without significantly increasing stress flow of said polymer, while leaving another area of said surface of said polymer unirradiated, whereby any of said metal on or opposite said irradiated areas of said polymer binds to said polymer; and

(c) removing any of said metal layer or film which has not bound to said polymer after step (b).

5,062,940

ELECTROLYTIC LIQUID PURIFICATION APPARATUS

Bruce Davies, Kenmore, Wash., assignor to Water Regeneration Systems, Inc., Kirkland, Wash.

Continuation of Ser. No. 163,501, Mar. 2, 1988, Pat. No. 4,917,782. This application Sep. 26, 1989, Ser. No. 412,832

Int. Cl.[5] C25B *15/02, 15/08, 9/00*

U.S. Cl. 204—228 **4 Claims**

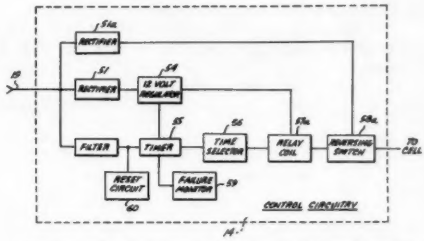
3. A liquid clarification apparatus comprising:

at least two plates of conductive material through which liquid containing impurities may flow;

energy supply means for supplying current to said plates to effect deposit of impurities from the liquid onto said plates;

monitoring means for monitoring the intervals of time during which said energy supply means supplies current to said plates in a first direction and a second direction; and

current-reversing means, coupled to said energy supply means, for reversing the direction of current supplied to said plates when the interval of time monitored by said monitoring means and corresponding to current in said first direction exceeds a first threshold and when the interval of time monitored by said



corresponding to current in said second direction exceeds a second threshold that is different from the first threshold.

5,062,941

ELECTROLYTIC PROCESS FOR STRIPPING A METAL COATING FROM A TITANIUM BASED METAL SUBSTRATE

Jiinjen A. Sue, Carmel, Ind., assignor to Union Carbide Coatings Service Technology Corporation, Danbury, Conn.

Filed Oct. 22, 1990, Ser. No. 600,929

Int. Cl.[5] C25F *5/00*

U.S. Cl. 204—146 **7 Claims**

1. A method for electrochemically stripping a metal compound of a metal selected from group IVB or VIB of the periodic table from a base metal of titanium or a titanium alloy in an electrolytic cell which comprises the steps of: immersing said base metal having a coating of said group IVB or VIB metal compound thereon into an electrolyte aqueous solution comprising an oxidizing reagent and an acid, said acid having a concentration so as to maintain a solution pH of less than 4.5, connecting said base metal as the anode of said electrolytic cell and a metallic member inert in said aqueous solution as the cathode, imposing a direct current voltage across said anode and cathode in a range of from about 6 to 40 volts DC at a bath temperature of between about 50° C. to 85° C.

5,062,942

FLUORESCENCE DETECTION TYPE ELECTROPHORESIS APPARATUS

Hideki Kambara, Hachioji; Tetsuo Nishikawa, Itabashi; Tomoaki Sumitani, Hachioji; Keiichi Nagai, Higashiyamato, and Yoshitoshi Ito, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1990, Ser. No. 506,986

Claims priority, application Japan, Apr. 12, 1989, 1-90843; Apr. 12, 1989, 1-90845; Aug. 28, 1989, 1-218582

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—299 R **25 Claims**

1. A fluorescence detection type electrophoresis apparatus, comprising:

(i) a migration lane on which sample fragments labeled with fluorophore migrate electrophoretically;

(ii) means for irradiating locally a predetermined portion to be irradiated with an excitation light for exciting said fluorophore, said predetermined portion being on said migration lane;

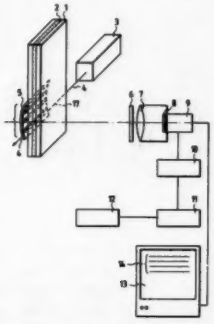
(iii) optical means for focusing a fluorescent light image which is emitted from said fluorophore at said predetermined irradiated portion, on a plurality of focusing positions separated from each other, said optical means comprising:

a) a focusing lens disposed on a predetermined distance from said predetermined irradiated portion; and

b) an image dividing means disposed on an optical path

from said predetermined irradiated portion to said focusing lens and makes said fluorescent light image visible as a plurality of virtual images positionally different from each other when said light image is seen from the focusing lens side;

iv) a plurality of wavelength selection means disposed on the respective optical paths from said predetermined irradiated portion to said plurality of focusing positions, said



respective optical paths lying separately from each other at the position of said wavelength selection means, and said plurality of wavelength selection means having transmission wavelength band different from each other; and

v) a light detector for detecting with positional distinction each light amount of a plurality of fluorescent light images each of which had passed through each of said wavelength selection means and focused on each of said focusing positions.

5,062,943

MODIFICATION OF BIFUNCTIONAL CATALYST ACTIVITY IN HYDROPROCESSING

Minas R. Apelian, Vincetown, N.J., and Clinton R. Kennedy, West Chester, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 4, 1990, Ser. No. 592,440
Int. Cl.[5] C10G *13/02*
U.S. Cl. 208—59 **17 Claims**

1. A method of controlling the operation of a hydrocracking process in which a hydrocarbon fraction is contacted under hydrocracking conditions in the prsence of hydrogen with a hydrocracking catalyst during a hydrocracking cycle comprising an initial phase and a second phase following the initial phase, the method comprising carrying out the initial phase of the hydrocracking cycle during which the hydrocracking temperature is being raised at a first rate from 1° to 20° F./day, in the presence of a nitrogen-containing organic compound which is added to the hydrocarbon fraction feed to reduce the hydrogen consumption, followed by carrying out the hydrocracking during a second phase of the hydrocracking cycle during which the temperature of the hydrocracking is raised at a second rate from 0.01° to 0.3° F./day, which is lower than the first rate.

5,062,944

CATALYTIC CRACKING PROCESS WITH MULTIPLE CATALYST OUTLETS

Tiberiu M. Leib, Voorhees, and Ajit V. Sapre, W. Berlin, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 6, 1989, Ser. No. 431,952
Int. Cl.[5] C01G *11/18*
U.S. Cl. 208—113 **11 Claims**

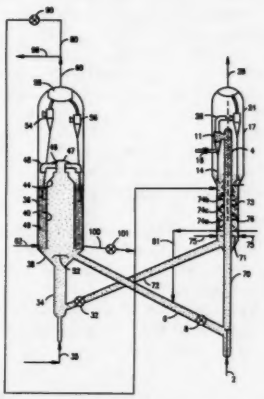
1. In a process for the fluidized catalytic cracking (FCC) of a hydrocarbon by contact of a crackable hydrocarbon with a source of regenerated FCC catalyst in a cracking reactor to produce catalytically cracked products and coked FCC catalyst which is regenerated in a single dense bed regenerator which maintains a catalyst inventory of at least 100 tons of catalyst as a dense phase, bubbling, fluidized bed of catalyst having a depth of at least 8 feet within a regenerator vessel having a diameter of at least 10 feet, wherein coked cracking catalyst is added via a single coked catalyst inlet having an inlet diameter of at least 1 foot, said inlet discharging coked catalyst into said regenerator dense bed, and wherein said coked catalyst is regenerated in said dense bed by contact with an upflowing supply of oxygen or an oxygen containing gas to produce regenerated catalyst which is withdrawn from said catalyst bed via a single catalyst outlet connected with said bubbling catalyst inlet, the improvement comprising use of a swirl regenerator comprising a swirling, fluidized dense bed of catalyst, wherein coked catalyst is added via a single inlet in the center of the regenerator dense bed and regenerated catalyst is withdrawn from said dense bed via at least two catalyst withdrawal means which are both radially distributed and symmetrically distributed about said single inlet.

5,062,945

METHOD OF FCC SPENT CATALYST STRIPPING FOR IMPROVED EFFICIENCY AND REDUCED HYDROCARBON FLOW TO REGENERATOR

David A. Pappal, Haddonfield, N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 248,058, Sep. 23, 1988, abandoned. This application Oct. 16, 1989, Ser. No. 423,610
Int. Cl.[5] C10G *11/18*
U.S. Cl. 208—113 **10 Claims**



1. A riser-reactor fluid catalytic cracking process comprising the steps of:

(a) mixing a hydrocarbon feed with hot regenerated cracking catalyst in the bottom section of a substantially vertical reactor riser to form a vapor-liquid suspension in said bottom section of said reactor riser at a temperature of about 525° to 650° C.;

(b) passing the mixture of step (a) upwardly through the reactor riser under selected temperature and residence time conditions to catalytically crack at least a portion of said hydrocarbon feed whereby said cracking catalyst is deactivated;

(c) flowing said mixture of step (b) through separation means to effect separation of catalyst particles from hydrocarbon conversion products;

(d) stripping hydrocarbon from said separated deactivated catalyst particles of step (c) by countercurrently contacting said catalyst particles with a stripping gas in an annular

stripping zone, said annular stripping zone being concentric with a lower section of said reactor riser;

(e) withdrawing stripped deactivated catalyst from said annular stripping zone of step (d);

(f) regenerating said withdrawn deactivated catalyst of step (e) in a regeneration zone remote from and in valved communication with said reactor riser at a temperature above that of said stripping zone whereby a hot flue gas is generated;

(g) withdrawing a controlled volume of hot regenerated cracking catalyst from a lower section of said regeneration zone;

(h) fluidizing said hot regenerated cracking catalyst of step (g) in a stream of hot flue gas withdrawn from said regeneration zone of step (f); and

(i) indirectly transferring at least a portion of the thermal energy of said fluidized mixture of step (h) to said stripping zone of step (d) to heat said stripping zone of step (d) and to cool said fluidized mixture of regenerated cracking catalyst and regenerator flue gas.

5,062,946

CATALYTIC DEWAXING PROCESS

Pierre Dufresne, Rueil-Malmaison, and Francis Raatz, Acheres, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 21, 1990, Ser. No. 541,859

Claims priority, application France, Jun. 21, 1989, 89 08358

Int. Cl.[5] C10G *11/08*

U.S. Cl. 208—115 **20 Claims**

1. A process for dewaxing hydrocarbons, comprising subjecting said hydrocarbons to dewaxing conditions in the presence of at least one catalyst comprising:

a/ 2 to 99.4% by weight of a synthetic crystalline zeolite of the ferrisilicate type, the approximate chemical formula of said zeolite being $M_{2/n}O$, Fe_2O_3, $xSiO_2$, where M represents a proton and/or a metal cation, n is the valence of M and x is a number ranging form 40 to 1,000, said zeolite having been synthesized in a fluoride medium and showing a fluorine content ranging from about 0.01 to 1.6% by weight, said zeolite having an X-ray diffraction diagram represented in Table 1 of the description,

b/ 0.1 to 97.5% by weight of a matrix, and

c/ at least one promoter selected from the group consisting of

Pd at a concentration by wt. ranging from 0.05 to 5%

Pt at a concentration by wt. ranging from 0.05 to 5%

NiO at a concentration by wt. ranging from 0.5 to 16%

CoO at a concentration by wt. ranging from 0.5 to 16%

MoO_3 at a concentration by wt. ranging from 0.1 to 30%

WO_3 at a concentration by wt. ranging from 0.1 to 40%.

5,062,947

SULFIDING OF HYDROGEL DERIVED CATALYSTS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 187,189, Apr. 28, 1988, Pat. No. 5,001,101. This application Aug. 28, 1990, Ser. No. 573,768

Int. Cl.[5] C10G *45/00*

U.S. Cl. 208—216 R **9 Claims**

1. A process for hydrotreating hydrocarbon feeds which comprises contacting said feeds at a temperature in the range of from about 400° F. to about 850° F. and a pressure in the range of from about 400 psig to about 2500 psig with a catalyst having improved desulfurization activity prepared by incorporating an element selected from the group consisting of nickel, cobalt and mixtures thereof, and a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, into an alumina hydrogel containing a phosphorus-containing compound, and sulfiding said catalyst with a gaseous sulfur compound at a temperature of at least about 900° F. for at least one hour.

5,062,948

MERCURY REMOVAL FROM LIQUID HYDROCARBON COMPOUND

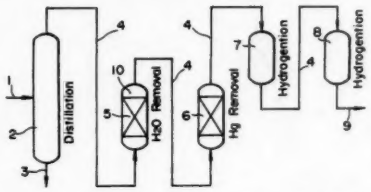
Tetsu Kawazoe, and Tsukasa Iida, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Feb. 28, 1990, Ser. No. 486,607

Claims priority, application Japan, Mar. 3, 1989, 1-51685

Int. Cl.[5] C10G *17/00*

U.S. Cl. 208—251 R **16 Claims**



1. A method for removing mercury from a liquid hydrocarbon compound which contains some water, a desired hydrocarbon compound of up to 8 carbon atoms and components having a higher molecular weight than the desired hydrocarbon compound of up to 8 carbon atoms along with mercury, which comprises the steps of:

(a) removing the components having a higher molecular weight than the desired hydrocarbon compound of up to 8 carbon atoms from said compound by distillation, filtration, adsorption by molecular sieves, or adsorption by zeolite,

(b) removing water from said compound by distillation, filtration, adsorption by molecular sieves, or adsorption by zeolite, by thereafter

(c) contacting the thus obtained compound with an adsorbent having an active component supported on a carrier to remove mercury contained in the thus obtained compound,

wherein said steps (a) and (b) are carried out in an arbitrary order.

5,062,949

DEFORMABLE SIEVE MAT SCREENING APPARATUS HAVING RAISED SIEVE MAT RIMS

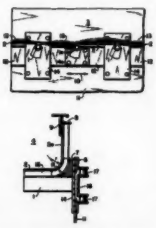
Herbert Hausmann, Cleisdorf, Austria, assignor to Binder & Co. Aktiengesellschaft, Gleisdorf, Austria

Filed Jul. 17, 1990, Ser. No. 554,207

Claims priority, application Austria, Jul. 21, 1989, 1765/89

Int. Cl.[5] B07B *1/30, 1/46*

U.S. Cl. 209—310 **3 Claims**



1. A screening apparatus comprising:

(a) an elongated support frame;

(b) a mobile, deformable sieve consisting of a sieve mat extending along the length of the support frame and having lateral edges; and

(c) a series of alternatingly immobile and mobile sieve mat carriers mounted on the support frame and extending transversely to the length of the support frame, the sieve

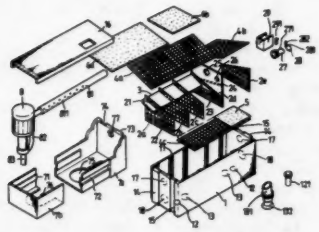
mat being affixed to the carriers and the mobile carriers being movable with respect to the support frame in the direction of the length of the support frame, the lateral sieve mat edges extending transversely to the carriers and being raised to form rims for the sieve mat, the carriers having support shoulders for the raised sieve mat rims which are free of perforations, and the support shoulders having an arcuate transition section.

5,062,950

PREFAB FILTER TANK WITH WARNING FUNCTION

Wen-Yau Shieh, No. 32, Yu Kuang Road, An Ping Area, Tainan City, Taiwan

Filed May 4, 1990, Ser. No. 519,399
Int. Cl.[5] B01D *35/14*; A01K *63/04*
U.S. Cl. 210—86 **1 Claim**



1. A prefab filter tank with warning function comprising a filter tank, a plurality of partitions, a water guiding board, a plurality of netted sheets, active carbon, filter fibre pads, motor seats, an alarm lamp seat, an overflow pipe, and a clean water pipe, wherein said filter tank is generally a rectangular and upward open tank with a removable top cover, a plurality of partition rails are bilaterally symmetrically formed on the inside of its two longer side walls for partitions to be fixedly supported therein, two sets of two preformed holes are separately provided at two ends of tank bottom, another two sets of preformed holes are separately formed on the two shorter end walls, and two pairs of suitable elongated tenons and mortises are diagonally symmetrically formed outside the two end walls normal to the tank bottom;

said water guiding board is inserted in slant slots formed at one side of the partitions, said slant slots have width of about one half the width of said partitions;

said netted sheets and active carbon are inserted in level slots formed at the opposite side of said partitions in a position slightly lower than the lower end of said slant slots; two of said netted sheets are separately placed on tops of partitions positioned at two sides of a main partition, a filter fibre pad is placed on each of said netted sheets on tops of said partitions;

said main partition has a meshy portion below its level slot and has a solid plate portion above its level slot, two through holes are formed in said solid plate portion for said water distributing pipe and a pipe head to transversely pass there, said pipe head has an outward and downward slant pipe end extending into the space between said main partition and one end wall of said filter tank with a shutter pivotally connected to the top of said slant pipe end, the upper end of said shutter extends to form a press plate which is closely aligned with a microswitch, said microswitch together with an alarm lamp or a buzzer are disposed in said alarm lamp seat mounted on said main partition and with its top projected out said tank top cover when said cover is covered on said filter tank;

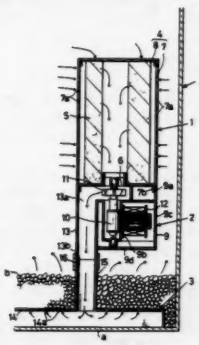
said motor seat is assembled by two parts which join with each other by matching sliding bars and sliding rails separately formed on their two side walls, on one of said motor seat parts, vertical tenon and mortise are formed at its end wall to match said tenons and mortises formed on two end walls of said filter tank permitting said motor seat to join to said filter tank at either end; a keyhole-shaped opening is formed on bottom of one of said motor seat parts and cooperates with an oblong opening formed on bottom of another motor seat part to adjust space left on bottom of said motor seat for receiving a motor, and a through hole is formed on one end wall of said motor seat corresponding to said preformed holes on two end walls of said filter tank and said one of through holes on said main partition for said water distributing pipe to pass.

5,062,951

FILTERING DEVICE FOR HOUSEHOLD AQUARIUMS

Kazutoshi Tominaga, Higashiosakashi, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kobyosho, Osaka, Japan

Filed Feb. 21, 1990, Ser. No. 483,058
Int. Cl.[5] A01K *63/04*
U.S. Cl. 210—169 **13 Claims**



12. A filtering device adapted for use in household aquariums, the device comprising:

a first casing having openings through its walls communicating with the inside of the aquarium, the first casing being placed on the aquarium bottom;

a second casing having openings through its walls communicating with the inside of the aquarium, the second casing being located above the first casing;

a cylindrical hollow filter medium housed in the second casing;

a pump unit means located midway between the upper casing and the lower casing so that the water in the aquarium casing is circulated first through the second casing, then the filter medium, the passageway, and lastly the first casing;

a passageway for communication from the second casing to the first casing, the passageway being constituted by detachably connecting a conduit portion of the pump unit to a conduit portion of the first casing; and

wherein the first casing comprises a shallow tray-like body having a size substantially equal to the whole area of aquarium bottom.

5,062,952

INJECTION MOLDING FILTER

Clayton L. Neuman, Coon Rapids, Minn., assignor to A-1 Engineering, Inc., Coon Rapids, Minn.

Continuation of Ser. No. 214,866, Jul. 1, 1988, abandoned, which is a continuation of Ser. No. 895,836, Aug. 12, 1986, abandoned. This application Jan. 10, 1990, Ser. No. 463,906
Int. Cl.[5] B01D *29/11*
U.S. Cl. 210—232 **13 Claims**

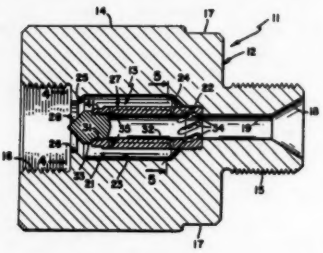
1. Apparatus for filtering a flow of fluid, comprising:

a housing having an inlet of predetermined cross sectional

size for receiving unfiltered fluid and an outlet of predetermined cross sectional size for discharging filtered fluid, and defining an internal chamber aligned between the inlet and outlet;

a filter element comprising a tubular body with an annular wall of predetermined thickness, the tubular body having a first open inlet end, a second closed end and a plurality of filter openings extending through said annular wall;

and means for mounting the open end of the tubular body to the housing with said open end in fluid communication



with said inlet and aid tubular body extending in cantilever fashion toward said outlet in alignment therewith with said second closed end unengaged within said internal chamber;

said tubular body and internal chamber being relatively sized to define a passage therebetween that is disposed in fluid communication with said outlet, and through which filtered fluid flows as it leaves the filter openings;

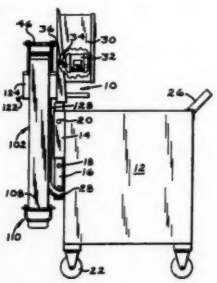
and the tubular body having a cross sectional size less than that of the housing outlet, whereby access to said tubular body may be gained through said housing outlet.

5,062,953

BELT TYPE OIL SKIMMER WITH HORIZONITAL ROLLERS

Philip C. Lewan, Jackson, Mich., assignor to Camshaft Machine Company, Jackson, Mich.

Filed May 10, 1990, Ser. No. 521,416
Int. Cl.[5] C02F *1/40*
U.S. Cl. 210—232 **18 Claims**



1. Apparatus for removing oil or the like from the horizontal surface of a body of liquid comprising, in combination, a frame adapted to be supported adjacent the body of liquid from which oil is to be removed, a primary elongated roller rotatably mounted on said frame for rotation about a substantially horizontal axis, said roller having an outer surface adapted to receive a substantially flat belt, a substantially flat endless belt having first and second sides, said belt first side engaging said roller, a pair of pressure rollers rotatably mounted on said frame movable toward and away from said primary roller, biasing means biasing said pressure rollers toward said primary roller, said pressure rollers being located substantially diametrically opposed to each other relative to said primary roller whereby said pressure rollers maintain said belt first side in engagement with approximately one half of the circumference of said primary roller, a motor mounted on said frame operatively connected to at least one of said rollers for rotating said rollers about their axes of rotation, and a collection receptacle mounted on said frame below said rollers receiving oil removed from said belt by said pressure rollers, said belt depending below said primary roller and pressure rollers and below said receptacle into the body of liquid from whose surface oil is removed.

5,062,954

CELLULOSE ABSORBENT PRODUCT AND METHOD OF MANUFACTURE

K. Duane Leedy, Perrysburg, and Norman A. Peiffer, Maumee, both of Ohio, assignors to The Andersons, Maumee, Ohio

Filed Apr. 15, 1991, Ser. No. 684,989
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—502.1 **16 Claims**

1. A process for producing an absorbent product comprising the following steps:

A) reducing a naturally occurring cellulose material to an intermediate pulverulent product;

B) adding moisture to said intermediate pulverulent product from step A);

C) compressing the intermediate pulverulent product from step B) to produce an intermediate product of compressed bodies having a nominal diameter of at least 3/16";

D) shearing said intermediate product of compressed bodies to produce compact bodies of smaller size than said compressed bodies;

E) classifying said compact bodies from step D) to produce a granular product of said bodies having a given screen size range.

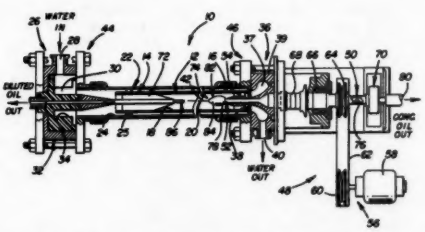
15. An absorbent cellulose granular product comprising compact bodies having an irregular surface and size which passes through a number 10 screen but is retained on a number 60 screen produced by the process of claim 1.

5,062,955

ROTATING SLEEVE HYDROCYCLONE

Steven F. Sciamanna, Moraga, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Filed May 30, 1990, Ser. No. 530,877
Int. Cl.[5] B01D *45/12*
U.S. Cl. 210—512.1 **10 Claims**



1. A hydrocyclone for separating a fluid comprising immiscible less dense and more dense liquids from one another, comprising:

a sleeve having upstream and downstream end portions and a longitudinal axis and defining a circularly symmetrical separation chamber;

a relatively stationary longitudinally extending outer casing defining a central passageway about said longitudinal axis in surrounding relation to said sleeve;

a relatively stationary fluid introduction structure having an

inlet port and an outlet port with said outlet port in flow communication with said chamber adjacent said upstream end portion of said sleeve, said fluid introduction structure being adapted to impart to said fluid an axial component in the direction of said downstream end portion of said sleeve;

a more dense-liquid recovery structure having an annular recovery entrance and an exit for recovery of said more dense liquid, said recovery entrance being radially displaced from the region of said axis and in flow communication with said downstream end portion of said sleeve;

fluid introduction structure mounting means for mounting said casing to said fluid introduction structure;

more dense-liquid recovery structure mounting means for mounting said casing to said more dense liquid recovery structure;

rotating means for rotating said sleeve in a selected rotational direction about said axis; and

less dense liquid recovery means for recovering said less dense liquid from the region of said axis.

5,062,956

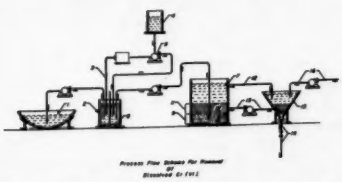
BIOREMEDIATION OF CHROMIUM (VI) CONTAMINATED AQUEOUS SYSTEMS BY SULFATE REDUCING BACTERIA

F. Stephen Lupton, Evanston; Louis J. DeFilippi, Mt. Prospect, and James R. Goodman, Chicago, all of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 177,557, Apr. 4, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 496,462

Int. Cl.[5] C22F *1/62*

U.S. Cl. 210—611 **7 Claims**



1. A method of reducing levels of Cr(VI) dissolved in a liquid aqueous residue resulting from chromium processing in amounts up to in excess of 200 ppm Cr(VI) said aqueous residue containing up to 5–10 wt. percent of dissolved salts comprising

a) adjusting the pH of said aqueous residue to a value between about 6.5 and 9.5 by adding a neutralizing agent and thereby increasing the content of dissolved salts;

b) adding to the pH adjusted residue (a) (1) a carbon source sufficient to sustain microbial growth, (2) a sulfate source sufficient to provide at least 10 millimoles sulfate per liter of said residue and (3) nutrients for sulfate-reducing anaerobic bacteria;

c) diluting the aqueous residue of (b) to provide no more than 200 ppm of Cr(VI) per liter of diluted residue;

d) contacting said diluted residue of (c) in the substantial absence of oxygen with sulfate-reducing anaerobic bacteria for a period of time sufficient to reduce the concentration of Cr(VI) to below about 0.05 ppm as chromium and to precipitate Cr(III) hydroxides.

5,062,957

PROCESS FOR REMOVING NITRATES FROM WATER

Edgar Berreby, 25 rue Paul Valéry, Paris, France 75116

Filed May 3, 1990, Ser. No. 518,467

Int. Cl.[5] C02F *1/42*

U.S. Cl. 210—611 **7 Claims**

1. A process to eliminate nitrates from water or aqueous solution, which process comprises:

a) passing nitrate-containing water or aqueous solution through a strong base anion exchange resin having a cation portion and having the following affinities: $HCO_3^- < Cl^- < SO_4^{--} < NO_3^-$, said resin having a polystyrenic matrix with quaternary ammonium groups $—NR_1R_2R_3^+$ in which R_1, R_2 and R_3 are identical or different and each represents a C_1–C_6 alkyl group or a C_1–C_3 hydroxy alkyl group or two of the symbols R_1–R_3, together with the nitrogen atom, form a heterocycle selected from the group consisting of pyrrolindino, piperidino, morpholino, and thiomorpholino, the resin being in the sulphate or bisulphate form to obtain 1) potable water and 2) the strong anion exchange resin in the nitrate form;

b) regenerating the strong anion exchange resin in the nitrate form to form the strong anion exchange resin in the sulphate or bisulphate form, which regeneration comprises the step of contacting the resin in the nitrate form with an aqueous solution containing sulphate or bisulfate anions to produce the strong anion exchange resin in the sulphate or bisulphate form and an acidic aqueous solution containing nitrates; and

c) treating the nitrate-containing solution produced by the regeneration process with heterotropic denitrifying bacteria in the presence of an organic nutrient for said bacteria.

5,062,958

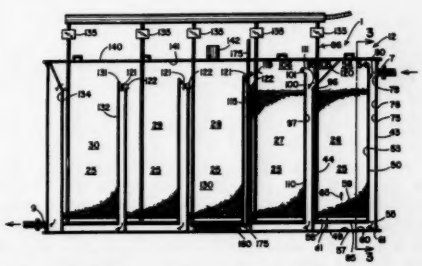
METHOD FOR WATER PURIFICATION

George F. Bateson, Roseville; Thomas J. Chresand, Minneapolis; Joel D. Moore, Bloomington, and Terrence L. Nayes, Eden Prairie, all of Minn., assignors to BioTrol, Inc., Chaska, Minn.

Division of Ser. No. 193,362, May 12, 1988, Pat. No. 4,952,552. This application Feb. 28, 1990, Ser. No. 486,805

Int. Cl.[5] C02F *3/06*

U.S. Cl. 210—611 **10 Claims**



1. A method of purifying water from a site contaminated with toxic and non-toxic organic materials; said method including the steps of:

(a) providing a reactor having an upstream end and a downstream end and comprising a plurality of treatment chambers oriented in series; each of said chambers having an upstream downcomer portion and a downstream column portion;

(i) each column portion having a downstream wall;

(ii) each chamber including a baffle member therein dividing said chamber into said downcomer portion and said column portion; each baffle member, except for a first, most upstream baffle member, having less upward extensions than a next upstream baffle member; and, the downstream wall of each column portion having less upward extension than a next downstream baffle member;

(b) providing biomasss support material in each of said chamber column portions;

(c) establishing a microbial consortium, of biomass capable of removing selected organic material in water to be treated, in said reactor by directing feed of water includ-

ing microbial species indigenous to the treatment site through said reactor in direction from said upstream end to said downstream end;

(d) purifying water by directing water to be purified from said upstream end to said downstream end; and,

(e) said steps of establishing a microbial consortium and purifying water both including passing water upwardly through biomass support material in each of said treatment chambers.

5,062,959

PROCESS FOR THE ENRICHMENT AND/OR ISOLATION OF HEART GLYCOSIDES WITH THE USE OF NON-POLAR ABSORBER RESINS

Carl H. Ross, Viernheim; Rudolf Machat, Mannheim; Werner Häring, Heppenheim/Kirschhausen, and Gustav Lettenbauer, Lampertheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

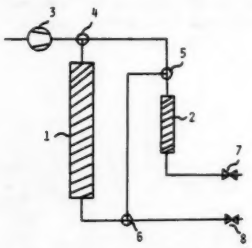
PCT No. PCT/EP87/00775, § 371 Date Oct. 17, 1988, § 102(e) Date Oct. 17, 1988, PCT Pub. No. WO88/04663, PCT Pub. Date Jun. 30, 1988

Continuation of Ser. No. 418,695, Oct. 2, 1989, abandoned, which is a continuation of Ser. No. 250,692, Oct. 17, 1988, abandoned. This PCT application Dec. 12, 1987, Ser. No. 581,147

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3642760

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—635 **3 Claims**



1. A process for the enrichment of and/or isolation of cardiac glycosides from a crude extract in which an aqueous solution of the extract is subjected to adsorption and desorption on non-polar, non-ionic resin based on crossed-linked styrene polymers, acrylic ester polymers and/or styrene-divinyl benzene copolymers, said resin having a specific surface area of from 100 to 1000 m^2/g and in which an eluant consisting of a mixture of water and an organic solvent which does not contain chlorinated hydrocarbons is used in the desorption step to obtain a preparative amount of cardiac glycosides.

5,062,960

METHOD AND APPARATUS FOR RECOVERING AN ACID FROM AN ACID-CONTAINING WASTE LIQUOR

Yoshiharu Aoki, and Toshikatsu Hamano, both of Chiba, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 429,379, Oct. 31, 1989, Pat. No. 4,954,262. This application Jul. 12, 1990, Ser. No. 551,409

Claims priority, application Japan, Nov. 8, 1988, 63-280412; Dec. 6, 1988, 63-306977; Dec. 22, 1988, 63-321916

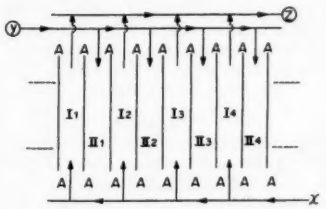
Int. Cl.[5] B01D *61/42, 61/50*

U.S. Cl. 210—638 **8 Claims**

1. An apparatus for recovering an acid from an acid containing waste liquor which overcomes the problem of heat accumulation in diffusion dialysis of waste acid liquor as a result of temperature increase which results in deterioration of the ion exchange membranes of the dialysis cell and heat deformation of cell parts all of which limit the operational life of the cell, comprising;

a diffusion dialysis cell divided into a plurality of alternating feed liquor compartments into which feed liquor is supplied and recovery compartments into which water is supplied by a plurality of anion exchange membranes, said cell being provided with a plurality of cooling compartments into which cooling water is supplied by the positioning of water-impermeable membranes in the cell such that said cooling compartments are adjacent to the feed liquor compartments or the recovery compartments, thereby controlling the temperature increases in the cell and extending the lifetime of the cell.

5. A method for recovering an acid from an acid-containing



waste liquor which overcomes the problem of heat accumulation in diffusion dialysis of waste acid liquor as a result of temperature increase which results in deterioration of the ion exchange membranes of the dialysis cell and heat deformation of cell parts all of which limit the operational life of the cell, comprising; conducting diffusion dialysis in a diffusion dialysis cell divided into a plurality of alternating feed liquor compartments into which feed liquor is supplied and recovery compartments into which water is supplied by a plurality of anion exchange membranes, said cell being provided with a plurality of cooling compartments into which cooling water is supplied by the positioning of water-impermeable membranes in the cell such that said cooling compartments are adjacent the feed liquor compartments thereby controlling the temperature increases in the cell and extending the lifetime of the cell.

5,062,961

PROCESS FOR THE DETERMINATION OF THE CONCENTRATION OF AN IONIC OR IONIZABLE SOLUTE IN ION EXCHANGE CHROMATOGRAPHY

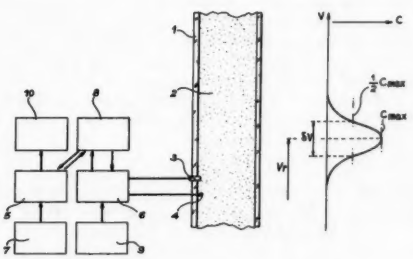
Michele Doury-Berthod, Gif sur Yvette, and Pierre Giampaoli, Montrouge, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 3, 1990, Ser. No. 499,470

Claims priority, application France, Oct. 27, 1988, 88 14038

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—656 **10 Claims**



1. Process for the determination of the concentration of a solute in an eluate, the solute being at least partly dissociated in the form of at least one anionic species, the eluate being also

constituted by hydrogen ions and species belonging to the acid-base system of an eluent at least partly dissociated in the form of at least one anionic species, the dissociation of these species and of those of the solute producing hydrogen ions, the composition of the eluate being more particularly governed by exchange reactions of ions previously used in the separating column between the anionic species of the eluent and those of the solute, said process comprising: calculating the concentration of the hydrogen ions solely as a function of the concentration of the solute with the aid of dissociation constants of acid species liable to be involved, invariable proportions for a given solute in a given chromatographic system of anions of the solute, which are exchanged in the separating column with eluent species of different valencies, proportions of the species of the solute dissolved in the separating column, the total concentration of the constituent species of the eluent and the concentration of the cationic species associated with the saline eluent species in the eluent, then calculating the concentrations in the eluate of at least some of its constituents, as a function of the solute concentration with the aid of the concentration of the hydrogen ions, then calculating a theoretical signal function consisting of superimposing effects resulting from concentration variations of the constituents of the eluate whose concentration has been calculated in the preceding stage and finally placing an experimental signal on the theoretical signal function in order to deduce therefrom the concentration of the solute and indicating the concentration of the solute.

5,062,962

METHODS OF CONTROLLING SCALE FORMATION IN AQUEOUS SYSTEMS

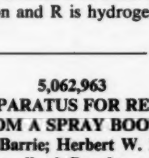
J. Michael Brown, The Woodlands; John F. McDowell, Spring, both of Tex., and Kin-Tai Chang, Columbus, Ga., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 4, 1990, Ser. No. 518,045

Int. Cl.[5] C02F *5/10*

U.S. Cl. 210—698 **18 Claims**

1. A method of controlling the formation and deposition of scale forming salts including calcium carbonate in a circulating aqueous system comprising introducing into said aqueous system a substoichiometric amount sufficient for the purpose of a treatment comprising a polyepoxysuccinic acid of the general formula



wherein n ranges from about 2 to about 50, M is hydrogen or a water soluble cation and R is hydrogen, C_{1-4} alkyl or C_{1-4} substituted alkyl.

5,062,963

METHOD AND APPARATUS FOR REMOVING SLUDGE FROM A SPRAY BOOTH

John Marcinkowski, Barrie; Herbert W. Bennett, Orillia, and Kenji Niwa, Barrie, all of Canada, assignors to DeVilbiss (Canada) Limited, Barrie, Canada

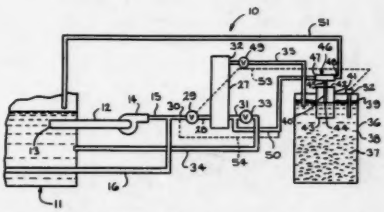
Filed Feb. 7, 1990, Ser. No. 478,146

Claims priority, application Canada, Mar. 17, 1989, 594020

Int. Cl.[5] B05B *15/12*

U.S. Cl. 210—712 **6 Claims**

4. Apparatus for removing paint sludge from a tank for a water wash paint spray booth comprising a liquid pump having an inlet connected to receive liquid from a paint spray booth tank and having an outlet, a plurality of eductors located in said tank, a first pipe means for returning liquid from said pump outlet through said eductors to said booth tank, said liquid returned through said eductors agitating liquid in said booth tank to maintain paint sludge in suspension, a hydrocyclone separator having an inlet, a clarified liquid outlet and a sludge outlet, a second pipe means for delivering liquid from said pump outlet to said separator inlet, a third pipe means for returning liquid from said separator clarified liquid outlet to said booth tank, a settling tank for collecting paint sludge and liquid from said separator sludge outlet, an aspirator pump



having a pressurized liquid inlet, an outlet and a suction inlet, means for circulating liquid from said separator clarified liquid outlet through said aspirator pump pressurized liquid inlet and said aspirator pump outlet to said booth tank, and liquid inlet means in said settling tank connected to said suction inlet for returning excess liquid from said settling tank to said booth tank.

5,062,964

PROCESS FOR CONTROL OF A FLOTATION SYSTEM

Herbert Ortner, and Lothar Pfalzer, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Apr. 6, 1990, Ser. No. 505,762

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1989, 3911233

Int. Cl.[5] B03D *1/02*; C02F *1/24*

U.S. Cl. 210—740 **4 Claims**

1. A process for controlling the quantity of foam generated in a flotation system in which said quantity is essentially determined by process parameters acting upon said system, said process comprising:

providing a probe for measuring the relative air content of sludge precipitated from said generated foam in the flotation system, said probe being operable to transmit a signal containing said relative air content;

withdrawing a sludge sample from said flotation system;

utilizing said probe to compress the withdrawn sludge sample, and to measure the relative air content of said sludge sample by determining the degree of compression of said sample;

providing a regulating apparatus, situated before or after said flotation system, for receiving the signal transmitted from said probe; and

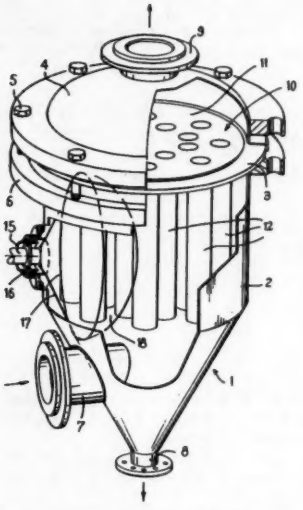
controlling the action of at least one of said process parameters on said flotation system in response to said signal, whereby the quantity of foam generated may be regulated.

5,062,965

FILTRATION APPARATUS COMPRISING AN ULTRASONIC CLEANING DEVICE AND CORRESPONDING CLEANING PROCESS

Jean-Louis Bernou, Fresnes; Frederic Dufau, La Celle St Cloud; Isabelle Geahel, St Germain En Laye, and Jean Hache, Voisins Le Bretonneux, all of France, assignors to Framatome, Courbevoie and Bertin & Cie, Plaisir, both of, France

Filed Nov. 7, 1989, Ser. No. 432,825
Claims priority, application France, Nov. 7, 1988, 88 14505
Int. Cl.[5] B01D *17/06*
U.S. Cl. 210—748 8 Claims



8. Process for ultrasonic cleaning of a filtration apparatus disposed in a circuit for supply of fluid to be filtered and for recovery of filtered fluid, said apparatus comprising a casing (2), an inlet conduit (7) for liquid to be filtered in said casing (2), an evacuation conduit (9) for filtered liquid, a bundle of porous filtration cartridges (12) disposed between said inlet conduit and said evacuation conduit over a predetermined length of said casing (2) in an axial direction and over a substantial part of a cross-section of said casing, and a device for ultrasonic cleaning (15, 16) of said porous filtration cartridges (12) constituted by spaced assemblies of transducers (15) disposed in at least one cross-sectional plane of said casing (2) in positions which are regularly spaced at a periphery of said casing (2), each of said transducers being placed within an opening passing through said casing, the process comprising the steps of

(a) isolating said casing from said circuit for recovery of filtered fluid;

(b) emitting ultrasonic waves by means of said transducers within cones having axes perpendicular to said filtration cartridges and a vertex located adjacent a wall of said casing (2) in the direction of said filtration cartridges (12), in such a manner as to tear out particles retained by said filtration cartridges (12);

(c) diffracting said ultrasonic waves emitted towards the interior of said casing (2) by an edge (50, 58) centered on an axis of emission of said ultrasonic waves; in such a manner as to increase a vertical angle of said cones of effectiveness within which said ultrasonic waves are emitted; and

(d) evacuating said particles torn out from the filtration cartridges (12) via an end of said casing (2).

5,062,966

PROCESS FOR DECOMPOSING SOLUTIONS OF HYDROXYLAMMONIUM SALTS

Ronald L. Dotson, and Sanders H. Moore, both of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Nov. 2, 1990, Ser. No. 608,416
Int. Cl.[5] C02F *1/58, 1/76*
U.S. Cl. 210—753 24 Claims

1. A process for decomposing an aqueous solution of a hydroxylammonium compound which comprises raising the pH of the solution to about 8 or higher and reacting the alkaline solution with a source of hypohalite ions.

5,062,967

METHOD FOR CONTROLLING ZEBRA MUSSELS USING DIDECYL DIMETHYL AMMONIUM HALIDES

Ramon A. Muia, Coraopolis, and Rodney M. Donlan, Bridgeville, both of Pa., assignors to Calgon Corporation, Robinson Township, Pa.

Filed Apr. 18, 1990, Ser. No. 510,495
Int. Cl.[5] C02F *1/50, 1/68*
U.S. Cl. 210—755 4 Claims

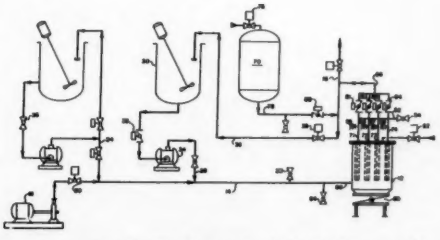
1. A method for inhibiting the growth of zebra mussels in an aqueous system which contains zebra mussels or which is prone to the growth of zebra mussels comprising adding to said system an effective amount of a didecyl dimethyl ammonium halide.

5,062,968

APPARATUS AND PROCESS FOR FILTERING FLUIDS

Theodore A. Warning, 11227 Rippling Meadows, Houston, Tex. 77064

Continuation-in-part of Ser. No. 96,634, Sep. 14, 1987, Pat. No. 4,874,533. This application Dec. 6, 1988, Ser. No. 280,673
Int. Cl.[5] B01D *37/02*
U.S. Cl. 210—771 16 Claims



1. An apparatus for filtering contaminated fluid, comprising:

a vessel having a filtration space therein;

means for introducing a contaminated fluid into the vessel;

means for introducing a filter media into the vessel;

a plurality of filter elements, each having an interior and an exterior, positioned inside the vessel, each filter element being provided with an individually controllable means for testing filtrate on an outlet of the filter element;

means for forming a layer of filter media on the exterior of the filter elements;

means for removing filtrate from the interior of the filter elements; and

means for draining the filter elements in fluid communication with the interior of the filter elements operable independently from the means for removing filtrate.

5,062,969

CROSSLINKABLE INTERPOLYMERS

Marlin D. Holtmyer; Charles V. Hunt, and Weldon M. Harms, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 22, 1989, Ser. No. 355,597
Int. Cl.[5] E21B *33/00*
U.S. Cl. 252—8.551 18 Claims

1. A method for treating a subterranean formation comprising:

providing an interpolymer that is the polymerization product of a mixture represented by the formula:

water soluble monomer	(x)	hydrophobe monomer	(y)	vicinal diol monomer	(z)

where the mole percent of each monomer is represented by x, y, and z and said hydrophobe monomer is selected from the group comprising alkyl methacrylate, acrylate esters, N-alkyl acrylamide, and N-alkyl methacrylamides with the alkyl group having 6 to 18 carbon atoms and y is a number of from about 0.5 to about 5;

inverting said interpolymer in an aqueous liquid to viscosify the liquid;

admixing a hydrophobe-containing surfactant with said liquid after inversion of said interpolymer in an amount whereby the viscosity of the liquid is caused to further increase;

admixing an agent capable of forming a crosslink with the diol functional group to subsequently form a crosslinked aqueous gel; and

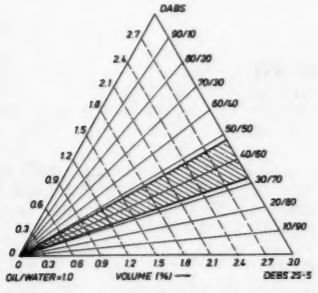
injecting the crosslinked interpolymer mixture with or without a particulate agent into said formation in a manner that results in an increase in the production of fluids from said formation.

5,062,970

SURFACTANT COMPOSITION

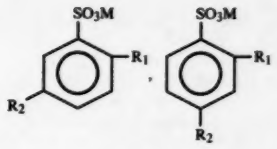
Herman M. Muijs; Nicolaas C. M. Beers, and Sebastianus P. F. M. Roefs, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 4, 1990, Ser. No. 532,546
Claims priority, application United Kingdom, Jun. 6, 1989, 8912963
Int. Cl.[5] E21B *43/22*
U.S. Cl. 252—8.554 9 Claims



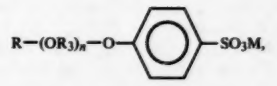
1. A surfactant composition suitable for enhanced oil recovery which comprises:

a) a dialkylated benzenesulfonate having a chemical formula selected from the group consisting of



and mixtures thereof, wherein M is an alkali metal and R_1 and R_2 are the same or different C_2–C_{20} alkyl groups, and

b) a polyalkoxyphenylethersulfonate of the chemical formula



wherein M is an alkali metal, R is a C_9–C_{22}-alkyl group and R_3 is a C_1–C_4-alkylene group, and n is an integer from 1 to 20, wherein the weight ratio of a:b is in the range of from about 60:40 to about 10:90.

5,062,971

STARCH WITH SILICONE GEL FOR EASE OF IRONING AND IMPROVED FABRIC APPEARANCE AFTER IRONING

Timothy W. Coffindaffer, Loveland; Robert G. Bartolo, Cincinnati, both of Ohio, and Kathleen A. Belfiore, Beaver Falls, Pa., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 6, 1990, Ser. No. 534,110
The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.[5] P06M *11/00*; C11D *3/00*
U.S. Cl. 252—8.6 25 Claims

1. A liquid starch composition for treating fabrics, said composition comprising: (1) from about 0.1% to about 33% of a polymeric silicone gel, (2) from about 0.1% to about 35% of a laundry starch and (3) an aqueous carrier; wherein said silicone gel has is curable and from about 3% to about 30% T (tri-functional units) $R'SiO_{3/2}$ and/or Q (quat-functional units), $SiO_{4/2}$ from about 70% to about 97% D (di-functional units), $R'_2SiO_{2/2}$ and up to about 10% (mono-functional units), $(RO)R'_2SiO_{1/2}$ and a molecular weight of from about 20,000 to about 1,000,000.

5,062,972

FABRIC CONDITIONING COMPOSITIONS: NATURAL HECTORITE CLAY AND BINDING AND DISPERSING AGENT

André C. Baeck, Bonheiden; Alfred Busch, Strombeek-Bever, both of Belgium, and Young S. Oh, Fairfield, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 287,977, Dec. 21, 1988, abandoned. This application Dec. 20, 1989, Ser. No. 453,442
Claims priority, application United Kingdom, Jan. 3, 1989, 8900027
Int. Cl.[5] D06M *11/06, 13/34*
U.S. Cl. 252—8.8 26 Claims

1. A granular fabric conditioning composition comprising agglomerates of from about 0.5% to about 40% of a binding/-dispersing agent and from about 10% to about 99% of a clay material, said clay material consisting essentially of a hectorite clay of natural origin, said hectorite clay having the general formula:

$$[Mg_{3-x}Li_x)Si_{4-y}Me^{III}_yO_{10}(OH_{2-z}F_z)]\frac{-(x+y)}{n}M^{n+}$$

wherein when $y \neq 0$, Me^{III} is Al, Fe, or B; or $y=o$; M^{n+} is a monovalent ($n=1$) or divalent ($n=2$) metal ion, said clay having a layer charge distribution ($x+y$) such that at least 50% of the layer charge is in the range of from about 0.23 to about 0.31; wherein said agglomerates have a median diameter of between about 75 microns and about 2000 microns.

5,062,973

STEARATE-BASED DRYER-ADDED FABRIC MODIFIER SHEET

George W. Kellett, Cranford, N.J., assignor to Creative Products Resource Associates, Ltd., Clifton, N.J.

Continuation-in-part of Ser. No. 331,870, Apr. 4, 1989, Pat. No. 4,938,879. This application May 9, 1990, Ser. No. 521,242

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] B05D *3/12;* **D06M** *13/02, 13/17, 13/48*

U.S. Cl. 252—8.75 **21 Claims**

1. A fabric modifier comprising a gelled sheet consisting essentially of about 15–30% water, about 40–60% of a water-miscible organic solvent selected from the group consisting of a glycol ether, a pyrrolidinone, an alkanol and mixtures thereof, and an effective gel-forming amount of an alkali-metal stearate, having uniformly distributed thereon an effective amount of a fabric softening agent selected from the group consisting of a cationic quaternary ammonium salt, an imidazolinium salt, a stearyl amine salt, a tertiary phosphine oxide, a tertiary amine oxide, a nonionic surfactant, an ethoxylated alcohol sulfate, a sodium alkyl sulfate, an alkyl sulfonate, a sodium alkyl benzene sulfonate, a sodium alkyl glyceryl ether sulfonate, a potassium alkyl glyceryl ether sulfonate, an amphoteric tertiary ammonium compound, a zwitterionic quaternary ammonium compound and mixtures thereof; so that an insignificant residue of said sheet remains in a rotary hot air dryer following the drying cycle.

5,062,974

MUNITIONS LUBRICANT AND PROTECTOR

Keith E. Van Meter, West Palm Beach, Fla., assignor to Lighthouse Manufacturing Co., Inc., West Palm Beach, Fla.

Filed Jun. 23, 1989, Ser. No. 370,456

Int. Cl.[5] C10M *125/22*

U.S. Cl. 252—11 **6 Claims**

1. A composition for surface treatment of firearms and bullets, comprising:

a) finely divided molybdenum disulfide, between 20 and 0.01 percent by weight;

b) alkali metal molybdate, between 5 and 0.01 percent by weight;

c) volatile organic solvent, between 99.9 and 75 percent by weight.

5,062,975

FUNCTIONAL FLUID WITH BORATED EPOXIDES, CARBOXYLIC SOLUBILIZERS, ZINC SALTS, AND CALCIUM COMPLEXES

Frederick L. Bayles, Jr., Rocky River; Reed H. Walsh, Mentor, and Craig D. Tipton, Perry, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 831,021, Feb. 19, 1986, abandoned. This application May 22, 1990, Ser. No. 526,967

Int. Cl.[5] C10M *141/12*

U.S. Cl. 252—33 **11 Claims**

1. A functional fluid comprising:

from about 88 to about 98.3 percent by weight based on the total weight of the functional fluid of a hydrocarbon oil and from about 1.7 to about 12 percent by weight based on the total weight of the functional fluid of an additive comprising:

from about 0.5 to about 5.5 weight percent of a calcium salt in the form of a calcium sulfonate complex which has been overbased with a calcium compound;

from about 1 to about 4 weight percent of an EP/antiwear agent in the form of a zinc salt of a dialkylphosphorodithioic acid treated with triphenylphosphite;

from about 0.1 to about 1.5 weight percent of a borated epoxide; and

from about 0.1 to about 1 weight percent of a carboxylic solubilizer in the form of an ester-salt reaction product of an acylating agent containing a substituted hydrocarbyl-based substituent containing about 12 to about 500 carbon atoms and an alkanol tertiary monoamine.

5,062,976

PROCESS FOR PREPARING AN EXTREME PRESSURE LUBRICATING OIL ADDITIVE

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 28, 1990, Ser. No. 545,003

Int. Cl.[5] C10M *143/06*

U.S. Cl. 252—45 **20 Claims**

1. A process for making an extreme pressure lubricant additive comprising the steps of:

(a) reacting sulfur monochloride with from about 1 to 2 moles of isobutylene per mole of sulfur monochloride at a temperature of from about 20° C. to about 80° C.;

(b) reacting the product produced in step (a) with an alkali metal monosulfide and free sulfur in a ratio of moles of alkali metal monosulfide to gram-atoms of free sulfur from about 1.8 to about 2.2:1;

(c) reacting the product produced in step (b) with an aqueous solution containing from about 5 to about 20 percent of an alkali metal hydroxide for a time sufficient to reduce the chlorine content below about 0.5 percent; and

(d) reacting the sulfurized isobutylene produced in step (c) with a mild oxidizing agent in a mole ratio of oxidizing agent to sulfurized isobutylene of between about 0.5 and about 2.5 moles of equivalent oxygen to 1 mole of sulfurized isobutylene at a reaction temperature between about 20° C. and about 95° C. under conditions sufficient to effect the appearance of new infrared frequency bands at 1300 cm^{-1} and 1030 cm^{-1} indicative of the formation of sulfoxides and sulfones and recovering a liquid oxidized sulfurized isobutylene product which is soluble in a lubricating composition.

5,062,977

SULPHUR-CONTAINING ADDITIVES TO LUBRICANTS WITH ANTIWEAR AND EXTREME-PRESSURE EFFECT AND THE PROCESSES FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THE SAID ADDITIVES

Laurent Germanaud, Valencin Le Fayet; Patrick Azorin, La Plaine - Mornant, and Lhopital Michel, Francheville, all of France, assignors to Elf France, Courbevoie, France

Filed May 14, 1990, Ser. No. 523,063

Int. Cl.[5] C10M *105/72*

U.S. Cl. 252—48.2 **19 Claims**

1. Sulphur-containing additives to lubricants, with anti-wear and extreme-pressure effect, comprises of asymmetric polysulphides containing a polysulphide group $R\text{-}S_x$-, where R denotes a C_1–C_{18} aliphatic radical and x varies between 2 and 10 in a vicinal position of a secondary or tertiary alcohol.

5,062,978

AQUEOUS LUBRICANT SOLUTIONS BASED ON FATTY ALKYL AMINES

Frank Weber, Duisburg, and Wolfgang Preibsch, Merzenich, both of Fed. Rep. of Germany, assignors to Unilever Patent Holdings BV, Rotterdam, Netherlands

Filed Nov. 29, 1989, Ser. No. 443,430

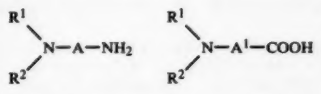
Claims priority, application European Pat. Off., Dec. 5, 1988, 88202781.6

Int. Cl.[5] C10M *173/02*

U.S. Cl. 252—49.3 **13 Claims**

1. An aqueous lubricant solution comprising consisting essentially of a lubricating amount of

(a) a fatty alkyl amine in an aqueous base, the fatty alkyl amine comprising at least one compound of the formula (I) or (II):



(I) (II)

wherein

R^1 is a saturated or unsaturated, branched or linear alkyl group having 8–22 carbon atoms,

R^2 is hydrogen, an alkyl group or hydroxyalkyl group having 1–4 carbon atoms, or —A—NH_2,

A is a linear or branched alkylene group having 1–8 carbon atoms, and

A^1 is a linear or branched alkylene group having 2–4 carbon atoms; and

the lubricant solution has a pH of from about 5 to about 8.

5,062,979

SOAP FREE CONVEYOR LUBRICANT THAT GIVES CLEAR SOLUTIONS IN WATER COMPRISING ALKOXYPHOSPHATE ESTER, ALKYL BENZENE SULFONATE AND CARBOXYLIC ACID

Rolf Scharf, Monheim, and Karl-Heinz Schmitz, Duesseldorf, both of Fed. Rep. of Germany, assignors to Ecolab Inc., St. Paul, Minn.

Filed Sep. 13, 1989, Ser. No. 406,984

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 3831448

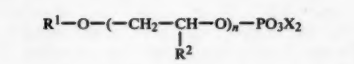
Int. Cl.[5] C10M *173/02*

U.S. Cl. 252—49.3 **14 Claims**

1. An aqueous, optically clear, substantially soap free lubricant composition having a pH value in the range from about 6 to about 8, capable of being diluted with optically clear hard water to form an optically clear solution therein, and comprising water and:

(a) from about 0.02 to about 15% by weight based on the total composition of alkyl benzene sulfonate molecules containing 10 to 18 carbon atoms in the alkyl part and having cations that are selected from the group consisting of alkali metal ions, ammonium ions and alkanolammonium ions containing 1 to about 14 carbon atoms in the alkanolamine part;

(b) from about 0.02 to about 15% by weight based on the total composition of partially esterified phosphonic acid or phosphate molecules corresponding to general formula (I)



(I)

in which R^1 is selected from the group consisting of aliphatic monovalent hydrocarbon radicals containing about 12 to about 18 carbon atoms, R^2 is H or CH_3, X is hydrogen or an alkali metal, and n is an integer in the range of about 8 to about 12; and

(c) from about 0.01 to about 10% by weight of the total composition of molecules selected from the group consisting of aliphatic carboxylic acids containing about 6 to about 22 carbon atoms and having a titer of not more than 20° C.; and, optionally,

(d) conventional solubilizers, solvents, foam inhibitors, disinfectants, or mixtures thereof, component (a) and component (b) being present in a ratio by weight of about 3:1 to about 1:3 and component (c) being present in a ratio by weight to the sum of components (a) and (b) of from about 1:20 to about 1:4.

5,062,980

POLYMERIC STEP LADDER POLYSUCCINIMIDE COMPOSITIONS SUITABLE FOR LUBRICATING OIL DISPERSANTS AND FUEL ADDITIVES

Cyril A. Migdal, Croton-On-Hudson, and Robert H. Jenkins, Jr., Walden, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

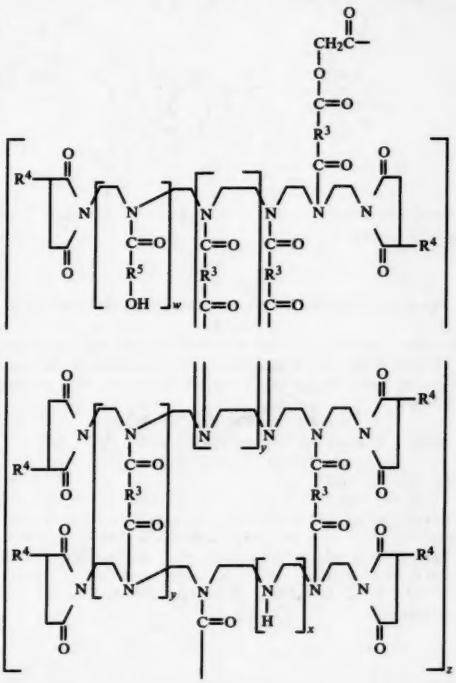
Filed Oct. 30, 1989, Ser. No. 428,545

Int. Cl.[5] C10M *133/16, 133/58, 149/18*

U.S. Cl. 252—51.5 A **16 Claims**

1. A polymeric step ladder polysuccinimide compound consisting essentially of at least three polyalkyleneamine chains, each of said chains being terminated at each end by a polyalkenyl succinimide, wherein each of said polyalkyleneamine chains is crosslinked to at least one other such chain by dicarboxylic acids which form amides by reaction with the secondary amines of said polyalkyleneamine chains.

6. A polymeric step ladder polysuccinimide compound having the formula:



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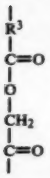


wherein R^3 is a hydrocarbyl group having from 2 to about 48 carbon atoms, R^4 is a polyalkenyl group, R^5 is an alkyl group having from 1 to about 4 carbon atoms, x ranges from 0 to about 9, y ranges from 0 to about 4, z ranges from 3 to about 1000 and w ranges from 0 to about 4, wherein each polyamine chain contains from 4 to about 14 nitrogen atoms.

5,062,981

MAGNET AND METHOD FOR MANUFACTURING THE SAME

Takuji Nomura; Shogo Miki; Takashi Sakauchi; Yoshitaka Sato, and Yuusuke Honma, all of Ohtsu, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 21, 1990, Ser. No. 541,672

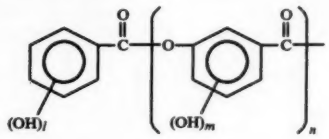
Claims priority, application Japan, Jun. 27, 1989, 1-164352; Feb. 2, 1990, 2-24695

Int. Cl.[5] H01F *1/053*; C09K *15/02*

U.S. Cl. 252—62.54 **8 Claims**

1. A magnet comprising a magnetic powder expressed by R-T-B, wherein R is Nd or that partially replaced with rare earth elements and T is Fe or that partially replaced with transition metals, and a chelate resin or a chelate resin in admixture with other synthetic resins.

2. A magnet as claimed in claim 1, wherein the chelate resin contains groups expressed by formula (I):



(I)

wherein l=integers of 1–5, m=integers of 1–4, and n=integers of 1 or more.

5,062,982

MAGNETIC POWDER FOR MAGNETIC RECORDING MEDIA

Haruhisa Yamamoto, Yokohama; Hidenobu Urata, Kamakura; Tatsuo Kinebuchi, Tokyo, and Hidenori Sawabe, Yokohama, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1990, Ser. No. 505,073

Claims priority, application Japan, Apr. 7, 1989, 1-86962

Int. Cl.[5] C04B *35/26*

U.S. Cl. 252—62.57 **5 Claims**

1. A hexagonal ferrite magnetic powder for magnetic recording media, which has an average particle diameter of at most 0.1 μm, a plate ratio of maximum diameter to maximum thickness of at most 8 and a temperature dependence of coercive force of at most 1.5 Oe/°C. in the temperature range of 20°–100° C. and is represented by the following general composition formula:

$$(Fe)_a(Zr)_b(Si)_c(M^1)_d(M^2)_e(M^3)_f(O)_g$$

wherein M^1 means at least one metal element selected from Ba, Sr, Ca and Pb, M^2 denotes at least one metal element selected from Mo and W, M^3 stands for at least one metal element selected from Mg, Ti, Mn, Ni, Cu, Zn, Sb, La, Al, In, Ce, Nd and Sm, a, b, c, d, e, f and g respectively represent the numbers of Fe, Zr, Si, M^1, M^2, M^3 and O atoms, a is a number of 8.0 to 12.0, b is a number of 0.01 to 6.0, c is a number of 0.05 to 6.0, d is a number of 0.3 to 6.0, e is a number of 0.01 to 6.0, and f is a number of 0.0 to 6.0, and g is the number of oxygen atoms satisfying the atomic valence of the other elements.

5,062,983

MAGNETIC POWDER FOR MAGNETIC RECORDING MEDIA

Haruhisa Yamamoto, Yokohama; Hidenobu Urata, Kamakura; Tatsuo Kinebuchi, Tokyo, and Hidenori Sawabe, Yokohama, all of Japan, assignors to Nippon Zeon Co., Ltd., Japan

Filed Apr. 30, 1990, Ser. No. 516,593

Claims priority, application Japan, May 11, 1989, 1-116069

Int. Cl.[5] C04B *35/26*

U.S. Cl. 252—62.57 **5 Claims**

1. A hexagonal ferrite magnetic powder for magnetic recording media, which has an average particle diameter of at most 0.08 μm, a plate ratio of maximum diameter to maximum thickness of at most 8, a saturation magnetization of at least 55 emu/g and is represented by the following general composition formula:

$$(Fe)_a(Sn)_b(Si)_c(M^1)_d(M^2)_e(M^3)_f(O)_g$$

wherein M^1 means at least one metal element selected from Ba, Sr, Ca and Pb, M^2 denotes at least one metal element selected from Cr, Y, Ce, Nd, Sm, Al, La and Cd, M^3 stands for at least one metal element selected from Mg, Ti, Mn, Ni, Cu, Zn, Sb, In, Mo and W, a, b, c, d, e, f and g respectively represent the numbers of Fe, Sn, Si, M^1, M^2, M^3 and O atoms, a is a number of 8.0 to 12.0, b is a number of 0.01 to 6.0, c is a number of 0.05 to 6.0, d is a number of 0.3 to 6.0, e is a number of 0.01 to 6.0, and f is a number of 0.0 to 6.0, and g is the number of oxygen atoms satisfying the atomic valences of the other elements.

5,062,984

POLYMER MIXTURE WHICH COMPRISES AN AROMATIC POLYCARBONATE AND A POLYALKYLENE TEREPHTHALATE, AND ARTICLES FORMED THEREFROM

Wilhemus M. M. Roovers, Steenbergen, Netherlands, and Jan de Boer, Verderel les Sauqueuse, France, assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 22, 1989, Ser. No. 455,124

Claims priority, application Netherlands, Dec. 27, 1988, 8803173

Int. Cl.[5] C08L *69/00, 67/02*

U.S. Cl. 525—67 **17 Claims**

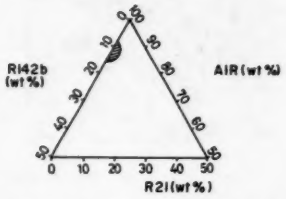
1. A polymer mixture which comprises A. an aromatic polycarbonate and B. a polyalkylene terephthalate, characterised in that the polymer mixture comprises C. cross-linked polymer comprising units derived from styrene or from a styrene compound substituted in the ring, from one or more C_4–C_8 alkyl(meth)acrylates and from a cross-linking agent, the cross-linked polymer particles having an average particle size from 1 to 30 microns.

5,062,985

REFRIGERANT COMPOSITION CONTAINING DICHLOROMONOFLUOROMETHANE

Kazuo Takemasa, Ota, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 15, 1990, Ser. No. 538,617
Claims priority, application Japan, Jun. 16, 1989, 1-155115; Oct. 4, 1989, 1-259060; Nov. 14, 1989, 1-295939; Nov. 14, 1989, 1-295945
Int. Cl.[5] C09K 5/04
U.S. Cl. 252—67 7 Claims



1. A refrigerant composition consisting essentially of from 50 to 0.1 wt % of dichloromonofluoromethane and respectively from 50 to 99.9 wt % of at least one fluoroalkyl compound selected from the group consisting of trifluoromethane, pentafluoroethane, monochlorodifluoromethane and 1-chloro-1,1-difluoroethane.

5,062,986

FILM-SHAPE SOAP

Takeshi Fujita; Chuzo Isoda, both of Uji, and Kazuyo Aketa, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Apr. 6, 1990, Ser. No. 505,471
Claims priority, application Japan, Apr. 20, 1989, 1-101163
Int. Cl.[5] C11D 17/06, 7/04
U.S. Cl. 252—134 5 Claims

1. A film-shape soap which comprises (a) a water soluble polymer and (b) a soap; said water soluble polymer is a polyester of polyether polyol having an weight average molecular weight of more than about 1,000 and a polycarboxylic acid, and has a weight average molecular weight of not less than about 20,000.

5,062,987

COOLING SYSTEM CLEANING SOLUTIONS

David E. Turcotte, and Daniel E. Coker, both of Woodhaven, Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Oct. 9, 1990, Ser. No. 594,907
Int. Cl.[5] C11D 3/00, 3/60
U.S. Cl. 252—156 17 Claims

1. An alkaline, storage stable cooling system cleaning concentrate composition having a pH of from 9 to 11, comprising in weight percent based on the total weight of the concentrate,

a. from 1 to about 30 percent of an EDTA salt selected from the group consisting of the alkali metal and ammonium salts of EDTA;

b. from 1 to about 50 percent of sorbitol;

c. from 0.5 to about 8 percent of a soluble nitrate salt;

d. from 1 to about 15 percent of a silicon containing aluminum corrosion inhibitor selected from the group consisting of alkali metal silicates, siliconates and silicone-silicate mixtures;

e. an amount of a glycol which is effective to render the composition storage stable; and

f. from 0.5 to about 8 percent of a mineral acid.

5,062,988

CLEANING COMPOSITION OF DIBASIC ESTER, HYDROCARBON SOLVENT AND COMPATIBILIZING COMPONENT

Kenneth T. Dishart, and Mark C. Wolff, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1989, Ser. No. 392,997
Int. Cl.[5] C11D 9/30, 15/04, 17/00, 7/50
U.S. Cl. 252—170 12 Claims

1. A cleaning composition designed for cleaning a printed circuit board consisting essentially of (1) a dibasic ester, (b) an aliphatic hydrocarbon solvent wherein the term hydrocarbon solvent excludes a terpene, and (c) a compatibilizing component which increases the solubility of the dibasic ester hydrocarbon solvent combination wherein a ratio of dibasic ester to hydrocarbon solvent is in a range from 5:95 to 25:75 by weight.

5,062,989

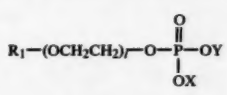
DETERGENT COMPOSITION

Jun Kamegai, Ichikawa, and Masatoshi Arisawa, Matsudo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jan. 10, 1989, Ser. No. 295,389
Claims priority, application Japan, Jan. 12, 1988, 63-4420
Int. Cl.[5] C11D 7/00, 3/04
U.S. Cl. 252—174.17 6 Claims

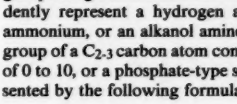
1. A shampoo, skin cleanser or fine fabric detergent composition consisting essentially of:

(A) 5–50 wt. % of a phosphate-type surface active agent represented by the following formula (I):



(I)

wherein R_1 represents a linear or branched alkyl group of a C_{8-18} carbon atom content, a linear or branched alkenyl group of a C_{8-18} carbon atom content, or an alkyl phenyl group of a C_{8-18} carbon atom content, with the alkyl group being either linear or branched, X and Y independently represent a hydrogen atom, an alkali metal, an ammonium, or an alkanol amine having a hydroxyl alkyl group of a C_{2-3} carbon atom content, and l denotes a value of 0 to 10, or a phosphate-type surface active agent represented by the following formula (II):



(II)

R_2 and R_3 independently represent a linear or branched alkyl group of a C_{8-18} carbon atom content, a linear or branched alkenyl group of a C_{8-18} carbon atom content, or an alkyl phenyl group of a C_{8-18} carbon atoms content, with the alkyl group being either linear or branched, X has the same meaning a defined in formula (I), and m and n independently denote a value of 0 to 10, or a mixture thereof, and

(B) 0.1–40 wt. % of an alkyl saccharide-type surface active agent represented by the following formula (III):

$$R_4\text{-}O\text{-}(R_5O)\text{-}(G)_p \qquad \text{(III)}$$

wherein R_4 represents a linear or branched alkyl group of a C_{8-18} carbon atom content, a linear or branched alkenyl group of a C_{8-18} carbon atom content, or an alkyl phenyl group of a C_{8-18} carbon atom content, with the alkyl group being either linear or branched, R_5 represents an alkylene group of a C_{2-4} carbon atom content, G repre-

sents a reduced sugar of a C_{5-6} carbon atom content, and p denotes a value of 1 to 10, said (A) and (B) constituting at least about 80 wt. % of the surfactants present in said detergent composition.

5,062,990

DISCOTIC OCTASUBSTITUTED TETRAPYRAZINOTETRAAZAPORPHYRAZINES

Iwawo Yamamoto, No 16-25, 2-chome, Fumiiri, Ueta City, Nagano Pref., and Kazuchika Ohta, Ueta, both of Japan, assignors to Eastern Co., Ltd., Chino and Iwawo Yamamoto, Ueda, both of, Japan, a part interest

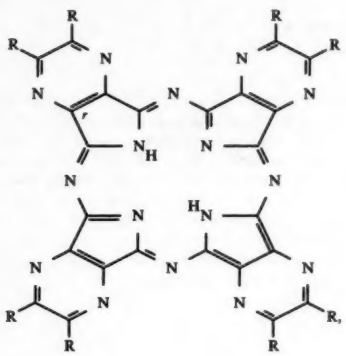
Filed Dec. 27, 1989, Ser. No. 457,397

Claims priority, application Japan, Feb. 17, 1989, 1-36018

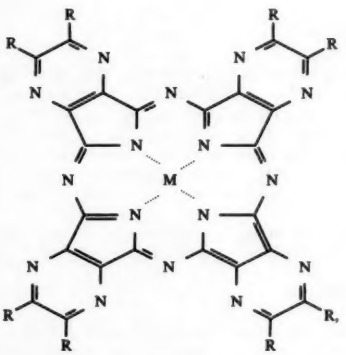
Int. Cl.[5] C09K *19/34, 19/58;* **C07D** *487/22*

U.S. Cl. 252—299.61 **14 Claims**

1. A discotic liquid crystal phase having electron-accepting character and comprising a tetrapyrazinotetraazaporphyrazine compound of the following formulas (1a) or (1b):



(1a)



(1b)

wherein R is selected from at least one of C_6H_{13}, C_7H_{15}, C_8H_{17}, C_9H_{19},$C_{10}H_{21}$,$C_{11}H_{23}$ and $C_{12}H_{25}$ and M is Cu, Zn, Pb, Fe, Co or Ni.

5,062,991

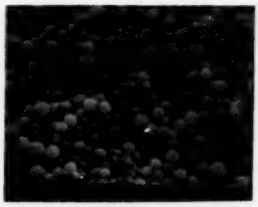
IN SITU USE OF GELATIN IN THE PREPARATION OF UNIFORM FERRITE PARTICLES

Olavi Siiman, Davie, Fla., and Alexander Burshteyn, Miami Lakes, both of Fla., assignors to Coulter Corporation, Hialeah, Fla.

Filed Jun. 4, 1990, Ser. No. 532,434

Int. Cl.[5] B01J *13/02;* **C09D** *5/23*

U.S. Cl. 252—315.2 **13 Claims**



1. A method of making colloidal ferrite particles of uniform size and shape comprising:

A. mixing a first solution of potassium nitrate and potassium hydroxide or sodium nitrate and sodium hydroxide, respectively, which has been nitrogen gas purged and a

B. second solution of a ferrous salt, divalent metal salt and a gelatin solution which second solution has been nitrogen purged;

C. sweeping the gelatinous metal hydroxide mixture of the two solutions with nitrogen gas and ripening same to form a ferrite hydrosol at a predetermined low temperature for a selected period of time;

D. washing the hydrosol with said gelatin solution by magnetic separation and redispersion,

whereby to form separate single metal ferrite particles coated with gelatin.

5,062,992

EMULSION MINIMIZING CORROSION INHIBITOR FOR NAPHTHA/WATER SYSTEMS

T. Miles McCullough, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 248,465, Sep. 23, 1988, abandoned. This application May 9, 1990, Ser. No. 521,286

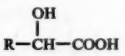
Int. Cl.[5] C23F *11/10*

U.S. Cl. 252—394 **11 Claims**

1. A corrosion inhibiting formulation comprising:

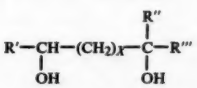
(a) an imidazoline dissolved in a hydrocarbon solvent;

(b) an effective amount of a 2-hydroxyalkylcarboxylic acid having the formula



where R is H or an alkyl group of from 1 to 6 carbon atoms; and

(c) an effective amount of a glycol having the formula



where R', R'' and R''' are independently, hydrogen or an alkyl group of from 1 to 4 carbon atoms, X is an integer from 0 to 4 and wherein when X=O, R'R'', and R''' are not all hydrogen, with said glycol having at least 4 carbon atoms, wherein said formulation is resistant to sludge formation and said formulation has an effect on oil/water

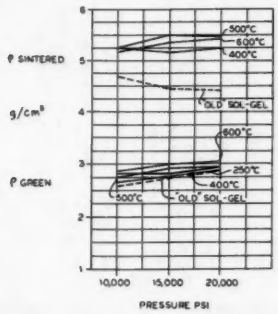
emulsion stability less than imidazoline alone when added to an oil/water solution.

5,062,993

PROCESS FOR FABRICATING DOPED ZINC OXIDE MICROSPHERE GEL

Wesley D. Arnold, Jr., Oak Ridge; Walter D. Bond, Knoxville, and Robert J. Lauf, Oak Ridge, all of Tenn., assignors to Cooper Power Systems, Inc., Coraopolis, Pa.

Filed Aug. 29, 1990, Ser. No. 575,178
Int. Cl.[5] H01C *10/16;* H01B *1/08*
U.S. Cl. 257—518 21 Claims



1. A process for producing a hydrous doped zinc oxide microsphere gel comprising the steps of:

mixing at least two zinc oxide dopants with water;

blending with said mixture a hydrous zinc oxide precipitate which has been washed to the point of peptization and dried at a temperature between 100° C. and 135° C.;

adding an alcohol to said blended mixture and separating hydrous zinc oxide gel microspheres from said alcohol mixture.

5,062,994

WATER-FREE SKIN CLEANING COMPOSITION IN THE FORM OF A TABLET

Diana Imperatori, Via Melloni, 8, 20129 Milano, Italy

Filed Nov. 15, 1989, Ser. No. 437,363
Claims priority, application Italy, Nov. 22, 1988, 22694 A/88
Int. Cl.[5] C11D *1/88, 17/00*
U.S. Cl. 252—545 1 Claim

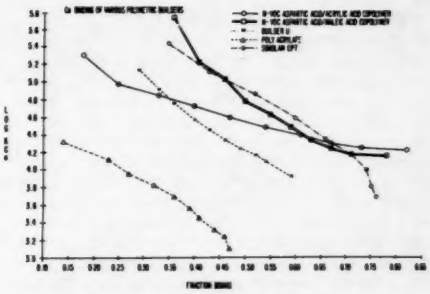
1. A moisture free skin-cleaning composition in tablet form comprising a skin cleaning powder and at least one absorbing powder miscible with said skin cleaning powder, said skin cleaning powder being included in said composition in an amount from 1 to 20% by weight and selected from the group consisting of alkyl sulfates, alkylether sulfates, non-ionic soaps of alkylamide or polyoxyethylene, amphoteric compounds selected from the group consisting of alkylammonium pyridine, isoquinoline halides, sulfates and phosphates; said absorbing powder being included in said composition in an amount from 1 to 20% by weight and being selected from the group consisting of cellulose, modified starches, kaolin, bentonite, talc, silicates, silica, magnesium carbonates, magnesium hydroxide, attapulgite, montmorrillonite and mixtures thereof; said composition further comprising a lubricating material in an amount from 0.5 to 10% by weight and being selected from the group consisting of talc, magnesium stearate, stearic acid, glycol stearate, skimmed milk powder, silicones and benzoates; said composition further comprising a disaggregating substance in an amount from 1 to 10% by weight so as not to form gels with water, said disaggregating substance being selected from the group consisting of alginates, carrageen, cellulose derivatives, gelatins, pectins and effervescent mixtures.

5,062,995

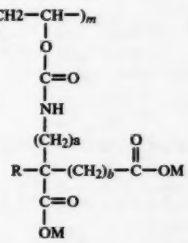
POLYMERIC CARBAMATE DETERGENT BUILDERS

Shang-Ren Wu, Mahwah, and Albert Garofalo, Whippany, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Feb. 6, 1990, Ser. No. 475,660
Int. Cl.[5] C02F *5/12;* C11D *7/32, 3/33*
U.S. Cl. 252—546 49 Claims



1. Polymeric compounds of the Formula:



wherein a and b are independently 0, 1, or 2 or even greater; m is at least one; R is hydrogen, methyl, ethyl, or long chain alkyl, alkenyl or aryl and M is C_{1-4} alkyl, hydrogen, or a cation which forms a substantially water soluble salt with said polymeric compound at ambient temperatures.

5,062,996

METHODS AND COMPOSITIONS FOR SORBING FLAMMABLE LIQUIDS

Joseph B. Kaylor, Jonesboro, Ga., assignor to Jannette G. Kaylor, Manassas, Va.

Continuation-in-part of Ser. No. 511,729, Apr. 20, 1990. This application Jun. 6, 1990, Ser. No. 533,786
Int. Cl.[5] C09K *21/00*
U.S. Cl. 252—610 18 Claims

1. A composition for absorbing a flammable liquid comprising a mixture of absorbent solids, dry chemical fire extinguishing agents and a polymer; said polymer being soluble in said flammable liquid and being of sufficiently high molecular weight to gel said liquid and to impart viscoelasticity to it; the ratio of polymer to absorbent solids being set such that when said absorbent solids are loaded to capacity with said flammable liquid, particles of said absorbent solid are bonded together with sufficient strength to allow convenient mechanical removal of said composition from a surface; and the ratio of dry chemical fire extinguishing agents to said absorbent solids and polymer being set such that the flammability of said composition after absorbing said liquid is reduced to a selected level.

5,062,997

PROCESS FOR THE CHLORINATION AND SULFOCHLORINATION OF ORGANIC COMPOUNDS

Franz-Josef Carduck, Haan; Willi Wuest, Ratingen-Hoesel; Hubert Harth, Duesseldorf, and Harald Liebs, Leverkusen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 729,313, May 1, 1985, abandoned. This application Dec. 16, 1986, Ser. No. 941,590

Claims priority, application Fed. Rep. of Germany, May 5, 1984, 3416668

Int. Cl.[5] C07C *303/10*

U.S. Cl. 260—400 34 Claims

1. In a process for the chlorination and sulfochlorination of starting materials which are fatty acids and/or their esters containing olefinically unsaturated fractions and which are liquid under reaction conditions, by reaction with chlorine and SO_2, in which the liquid starting material is circulated through a reaction zone where it is reacted with chlorine and SO_2 which have been introduced into the circuit, the improvement wherein the chlorine and SO_2 are introduced in parallel current with the liquid starting material and, together with the liquid starting material, are passed through an intensive mixing step during or before entry into the reaction zone, the quantity of chlorine and SO_2 introduced being such that the reaction mixture passes through the reaction zone as a substantially homogeneous liquid phase, wherein the process is conducted in two reaction loops, the first loop effecting chlorination of the olefinic double bonds and the second loop effecting the subsequent sulfochlorination, both of said reaction loops having an intensive mixing step during or before entry into their respective reaction zones.

5,062,998

PREPARATION OF METALLATED AND SUBSTITUTED ALKYNES

Frederick L. Herman, Allentown; Ann C. L. Savoca, Sinking Spring, and Mark L. Listemann, Whitehall, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 23, 1990, Ser. No. 513,133

Int. Cl.[5] C07F *1/02, 1/04, 1/06, 1/00*

U.S. Cl. 260—665 R 8 Claims

1. A process for making metallated 1-alkynes which comprises contacting in an inert solvent under conditions for allene isomerization an allenic hydrocarbon of 3 to B carbon atoms with an alkali metal in the presence of an allene isomerization catalyst, thereby forming a metallated 1-alkyne.

5,062,999

VAPORIZER FOR AN ANESTHETIC MEDIUM

Carl F. Wallroth, Lübeck; Wolfgang Falb, Krummesse, and Helmut Mohr, Stockelsdorf, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Apr. 12, 1990, Ser. No. 507,953

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1989, 3912818

Int. Cl.[5] B01F *3/04;* A61M *11/04*

U.S. Cl. 261—39.1 7 Claims

1. A vaporizer for adding an anesthetic medium to a gas comprising:

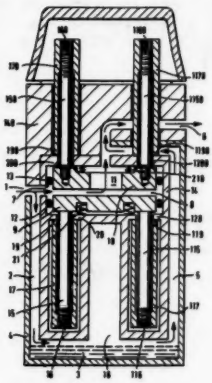
a housing defining a reservoir for holding the anesthetic medium;

said housing having inlet means for receiving the gas and outlet means for conducting the gas out of the vaporizer;

passage means extending from said inlet for passing a first component of the gas over said anesthetic medium so as to cause said first component to entrain vapors of the anesthetic medium therein;

first and second members mounted in said housing to conjointly define throttling gap means for throttling a second component of the gas entering said inlet means and passing the throttled second component to said outlet means to mix with said first component;

first temperature-responsive compensation means connected to one of said members for displacing said one member in dependence upon ambient temperature so as to adjust the width of said gap means thereby increasing or decreasing the quantity of the gas of said second component;



second temperature-responsive means connected to the other one of said members for displacing said other one of said members in dependence upon ambient temperature to coact with said first temperature-responsive means for adjusting the width of said gap means; and,

an enclosure made of corrosion-resistant material disposed in said housing so as to enclose said compensation means in a gastight manner with respect to said passage means.

5,063,000

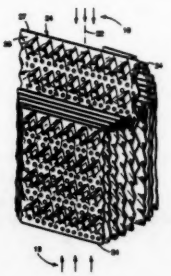
PACKING ELEMENTS

Thomas W. Mix, 28 Atwood St., Wellesley, Mass. 02181

Filed May 3, 1989, Ser. No. 346,983

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—94 28 Claims



1. A device for enhancing contact between a fluid having a predominant direction of flow and a second fluid, comprising

a layer of material including a flat portion lying in a plane generally aligned with said direction of flow,

said layer having a series of fluid deflection surfaces each of which comprises a corrugation that projects from said flat portion out of said plane, adjacent corrugations in said series projecting in opposite directions from said plane of said flat portion, said series being positioned generally along a line lying in said plane and at an angle to said direction of flow, adjacent corrugations in said series

being oriented at different oblique angles to said direction of flow.

5,063,001

METHOD OF COMPACTING RADIOACTIVE METAL WASTES

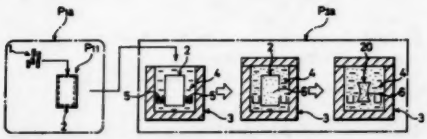
Hidehiko Miyao, Katsuta; Satoshi Ikeda, Mito; Masao Shiotsuki, Mito; Shigeyoshi Kawamura, Mito; Fumiaki Komatsu, Kobe; Ikuji Takagi, Ibaraki, and Tadamiti Sakai, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe and Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, both of, Japan

Filed Aug. 20, 1990, Ser. No. 569,964

Claims priority, application Japan, Sep. 28, 1989, 1-253857

Int. Cl.[5] G21C *21/00*

U.S. Cl. 264—0.5 **7 Claims**



1. A method of compacting radioactive metal wastes, comprising the steps of:

enclosing the radioactive metal waste in vacuo in a capsule,

placing the capsule into a pressure container,

subjecting the capsule to an increased pressure at high temperature to compact the waste, and

increasing water vapor content of the atmosphere in the pressure container at a time no later than said step of subjecting the capsule to an increased pressure.

5,063,002

METHOD FOR PRODUCING AN ELASTOMERIC CRUMB USING GAS TO FIRST CUT AN EXTRUDED HOT, STICKY ELASTOMERIC EXTRUDATE MATERIAL, FORM THE CRUMB, AND THEN CONVEY IT AWAY

Norman E. Luker, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 225,059, Aug. 9, 1988, Pat. No. 4,954,352. This application Feb. 14, 1990, Ser. No. 479,837

Int. Cl.[5] B29C *9/02*

U.S. Cl. 264—12 **3 Claims**

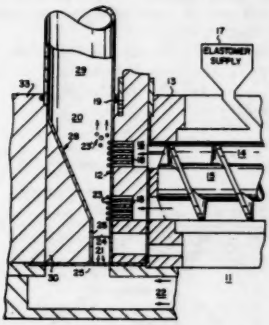
1. A method for producing crumb particles of an elastomer comprising:

extruding a hot, sticky elastomeric mass through orifices in a multi-orifice die plate into a chamber of variable cross-section, which forms a zone of reduced cross-section and a contiguous zone of increased cross-section,

supplying a stream of gas int o the zone of reduced cross-section sufficient to form a high velocity gas stream of 150 to 600 feet per second,

directing the flowing high velocity gas stream emitted from the zone of reduced cross-section substantially tangentially across the face of the die plate thereby severing the hot, sticky elastomeric material emerging form the orifices to form the crumb particles, while

said gas stream is conveying said crumb particles away from said die plate into said zone of increased cross-section where the velocity of the gas stream decreases to a level which results in temporary accumulation of a portion of said severed crumb particles in the vicinity of said die plate but away from said zone of reduced cross-sectional area but ultimately resulting in conveying said severed



crumb particles through said zone of increased cross-section and out of said chamber.

5,063,003

METHOD FOR MANUFACTURING AMORPHOUS SILICA OBJECTS

Carlos Gonzalez-Oliver, Backnang-Waldrems, Fed. Rep. of Germany, assignor to Battelle Memorial Institute, Geneva, Switzerland

Filed Nov. 15, 1989, Ser. No. 436,890

Claims priority, application European Pat. Off., Nov. 15, 1988, 88810782.8

Int. Cl.[5] B29B *9/00*; C01B *33/12*

U.S. Cl. 264—14 **20 Claims**

1. A method for manufacturing moulded bodies of amorphous silica under non-melt-collapsing conditions, this method comprising the steps of:

a) subjecting one or more alkoxysilanes to prehydrolysis by means of water and catalysts whereby oligomeric siloxane precursors solutions are formed;

b) converting said oligomer precursor solution into a spray of fine droplets by atomizing with a nozzle under gas pressure and discharging this spray into a stirred aqueous medium in which the polymerization of said siloxane oligomers will continue due to further hydrolysis therein and self-condensation, whereby the droplets will turn into hardened, cured polysiloxane beads or grains in the form of a slurry in said aqueous medium;

c) separating said beads from at least most of said aqueous medium and forming them into a paste by blending with binder, plastifier and fluidizing solvent;

d) casting or moulding said paste under pressure into shaped green substrate forms, most of the fluidizing solvents being squeezed out by the pressure;

e) drying the forms and subjecting to heat to destory and to evaporate volatile or decomposable components still present therein;

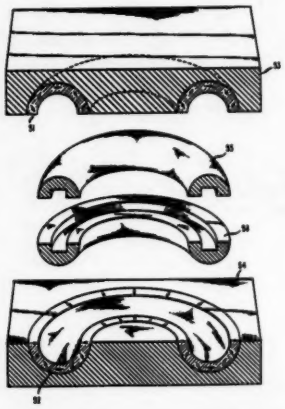
f) sinter the heat-treated form at temperatures substantially below the melting of SiO_2, whereby densification to a non-porous silica structure occurs, thus substantially avoiding possible substrate deformation due to fusion during sintering.

5,063,004

FABRICATION OF PERMANENT MAGNET TOROIDAL RINGS

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 302,706, Jan. 26, 1989, Pat. No. 4,911,627.
This application Nov. 3, 1989, Ser. No. 431,278
Int. Cl.[5] B29C *35/02*
U.S. Cl. 264—22 5 Claims



1. A method for fabricating a permanent magnet toroidal ring comprising the steps of forming a hollow cylindrical permanent magnet flux source into a toroidal shape, splitting the toroidal flux source into two halves through its major equator, mounting two halves of a hollow toroid of magnetically neutral material into the two halves of the toroidal flux source, placing the two halves of the toroidal flux source in juxtaposition, depositing an unmagnetized suspension of magnetic material into the cavity of the toroid of neutral material, allowing time for the magnetic material to set and be magnetized, separating the halves of the toroidal flux source, and removing the permanent magnet toroidal ring from within the toroid of neutral material.

5,063,005

PREPARING HEAT SHRINKABLE WRAPS

Anthony J. Doheny, Jr., Natick, Mass., assignor to The Kendall Company, Mansfield, Mass.

Continuation-in-part of Ser. No. 170,177, Mar. 18, 1988, abandoned. This application Dec. 4, 1989, Ser. No. 445,505
Int. Cl.[5] B29C *35/10*
U.S. Cl. 264—22 17 Claims

1. A process for preparing a heat shrinkable film comprising steps of:

(1) depositing a mass of polyolefinic material at the nip of the first and second rolls of three-roll calender in which the second and third rolls rotate at approximately the same speed and the first roll rotates at a slower speed, said first roll being heated to a temperature above the melting point of said polyolefinic material, said second roll is heated to an elevated temperature below the melting point of said polyolefinic material, and said third roll is chilled relative thereto;

(2) extruding said mass of polyolefinic material between said first and second rolls to form a film adhering to the surface of said second roll;

(3) transporting said film from said second roll around said third roll;

(4) transporting said film from said third roll of said calender under tension, whereby to effect partial orientation of said film in the machine direction and to maintain substantially all the molecular orientation imparted to said film during said calendering steps;

(5) passing said film in the path of irradiation from a low energy electron beam while subjecting one surface of said film to said irradiation at voltage such that the radiation dose at the half-depth of said film is approximately one-half the dose at said irradiated surface and at a current to film surface speed ratio such that the surface dose would effect crosslinking sufficient to impart to said film a 100% modulus at 150° C. of from about 10 to about 100 pounds per square inch if the dose at any depth in the film were substantially equal to said surface dose;

(6) passing said film in the path of irradiation from a low energy electron beam while subjecting the opposed surface of said film to said irradiation at a voltage and at a current to speed ratio substantially equal to that in the irradiation of said one surface, such that the 100% at 150° C. of said film as a whole is from about 10 to about 100 pounds per square inch and said film is characterized as being substantially uniformly crosslinked throughout its thickness, thereby achieving a balance between moderate longitudinal shrink and very little width expansion; and

(7) molecularly orientating said film by stretching in the machine direction to provide a shrinkability of at least 25 percent upon heating said film in an absence of constraints;

(8) applying a layer of adhesive to said film, whereby to form a heat shrinkable adhesive tape.

5,063,006

METHODS FOR REPAIRING CRACKS IN CONCRETE STRUCTURES

Tetsuo Tahara, Onojo, Japan, assignor to Shinnihon Jushikako Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 529,729, May 29, 1990, abandoned, which is a continuation of Ser. No. 216,377, Jul. 8, 1988, abandoned. This application Feb. 22, 1991, Ser. No. 658,459
Claims priority, application Japan, Jul. 13, 1987, 62-175723; Oct. 1, 1987, 62-249358; Oct. 1, 1987, 62-249359
Int. Cl.[5] B29C *31/04;* B32B *35/00;* E02D *37/00;* E04G *23/02*
U.S. Cl. 264—35 7 Claims

1. A method of repairing a continuous elongated crack in a concrete surface, comprising the steps of:

(a) overlying said crack along its entire length and width with a plurality of case members arranged in side-by-side relationship, each case member overlying less than said entire length of said crack and defining a chamber projecting outwardly of said surface and having a width greater than said width of said crack, each of said chambers having a predetermined open area and volume communicating with and covering said crack,

(b) securing each of said case members individually to said surface by anchor bolts such that a seal which resists strong pressure is effected between said surface and respective surface-opposing edges of each of said case members, thereafter

(c) introducing under pressure a urethane blowing agent through a valved inlet opening in each case member while a valved outlet opening in each respective case member is open, whereby said introduced blowing agent forces air and moisture outwardly through said valved outlet opening of each respective case member, thereafter

(d) closing said valved outlet openings when said air and moisture have been sufficiently discharged from said

crack and when said chambers of said respective case members are filled with said urethane blowing agent,

(e) closing said valved inlet openings of said respective case members, and

(f) allowing said urethane blowing agent to expand within said filled chambers and said crack, to thereby penetrate into said crack under the force of said expansion.

5,063,007

PROCESS FOR MANUFACTURING A CERAMIC FOAM BODY

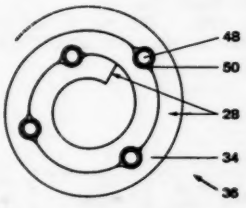
Jean-Pierre Gabathuler, Schleitheim; Karl-Ludwig Eckert; Peter Käser, both of Schaffhausen; Albert Maurer, Thayngen, and Anton Fischer, Schaffhausen, all of Switzerland, assignors to Alusuisse-Lonza Services Ltd., Zurich, Switzerland

Filed Jul. 18, 1990, Ser. No. 555,101

Claims priority, application Switzerland, Aug. 8, 1989, 2926/89

Int. Cl.[5] B29H *7/20*

U.S. Cl. 264—44 **6 Claims**



1. Process for manufacturing a Z-flow filter comprising an open pore foam body with a three-dimensional ceramic structure, which comprises:

(a) providing a soft open pore plastic foam strip;

(b) impregnating said foam strip at least once with a ceramic suspension;

(c) freeing said foam strip of excess ceramic suspension;

(d) assembling a spiral-shaped plastic foam block with a layered structure having flow channels from said impregnated foam strip by coiling said impregnated plastic foam strip to form layers and forming said flow channels by clamping thin-walled tubes of a combustible plastic in the layers alternatingly, the plastic foam strip having narrow longitudinal sides and each of said tubes having one end flush with one of said narrow longitudinal sides, the length of said tubes being about the depths of said flow channels;

(e) heating said spiral-shaped plastic foam block to a temperature below the melting point of the plastic; and

(f) burning off the plastic foam and plastic tubes at a temperature at which the ceramic sinters together to form a Z-flow filter with longitudinal channels therein which serve as flow channels.

5,063,008

METHOD FOR PRECISION VOLUMETRIC CONTROL OF A MOLDABLE MATERIAL IN AN INJECTION MOLDING PROCESS

James J. Wenskus, Jr., Rochester, and Alan B. Miller, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1990, Ser. No. 585,538

Int. Cl.[5] B29C *45/77, 45/80*

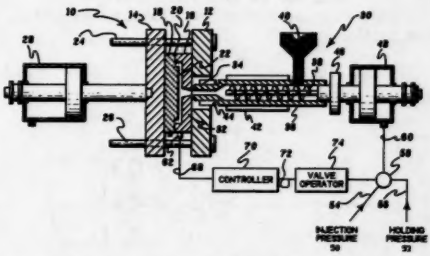
U.S. Cl. 264—40.5 **10 Claims**

1. An improved molding method for use with a molding apparatus having a pair of separable mold elements forming a mold cavity therebetween, means for opening and closing the mold elements and means for introducing a moldable material into the mold cavity at a first pressure and for exerting a second pressure on the moldable material as it cures in the cavity, said method comprising:

closing the mold elements:

introducing a moldable material into the mold cavity at the first pressure;

periodically measuring the separation distance between the mold elements while the moldable material is being introduced into the cavity;



integrating the separation distance as a function of time while the moldable, material is being introduced into the cavity to obtain an integral value;

detecting when the integral value reaches a preselected value;

changing the pressure from the first pressure to the second pressure when the integral value reaches the preselected value; and

opening the mold elements when the moldable material has cured.

5,063,009

PROCESS FOR PREPARATION OF HOLLOW FIBERS FOR FLUID SEPARATOR CONSTRUCTION

Shoji Mizutani, and Nobuo Taneda, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 235,845, Aug. 24, 1988, abandoned, which is a division of Ser. No. 796,865, Nov. 12, 1985, Pat. No. 4,781,833. This application Jan. 26, 1990, Ser. No. 477,174

Claims priority, application Japan, Nov. 16, 1984, 59-240589; Nov. 16, 1984, 59-240590; Nov. 16, 1984, 59-240591; May 30, 1985, 60-115270; Jun. 19, 1985, 60-131990

Int. Cl.[5] D01D *5/247, 5/253*

U.S. Cl. 264—49 **7 Claims**

1. A process for preparing, by melt-spinning, a selective-permeable hollow fiber for blood dialysis having a urea clearance not less than 160 ml/min and having an outer diameter of about 100 to 500 μ, a hollow portion piercing in the longitudinal direction and 1 to 10 fins extended in the longitudinal direction on a periphery thereof the fins having a height H to width W ratio H/W of at least 0.4, wherein a spinning liquid containing at least one cellulose ester polymer having an average degree of polymerization of at least 150 and at least one additive for forming pores is extruded into a gas phase from a spinning nozzle for said hollow fiber having an annular double slit and 1 to 10 notches formed on an outer side of the double slit, the viscosity of the spinning liquid at said nozzle is 200 to 5,000 P, the distance between the spinning nozzle's end face and the point where the hollow fiber extruded from the spinning nozzle is solidified in the gas phase is less than about 40

cm, and the solidified hollow fiber is treated so that it has selective-permeable properties.

5,063,010

MAKING PRESSED BOARD

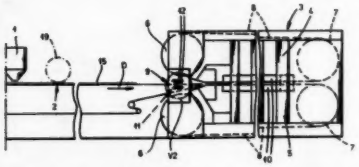
Tilman Fischer, Meerbusch; Hans-Dietrich Sitzler, Nettetal, and Werner Ufermann, Schwalmtal, all of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Apr. 20, 1990, Ser. No. 511,411

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914106

Int. Cl.[5] B29C *43/22*

U.S. Cl. 264—109 12 Claims



1. A method of making a board, the method comprising the steps of sequentially:

forming a mixture of an aqueous binder and particles having a relatively low moisture content of between 5% and 10% by weight;

depositing the mixture as a mat on a movable substrate, the mat being substantially at ambient temperature and having the relatively low moisture content;

preheating the mat with steam at a temperature of between 100° C. and 140° C. to raise the mat's temperature and to increase its moisture content to a relatively high moisture contents of between 10% and 15% by weight; and

simultaneously heating and compressing the mat to form same into a board.

5,063,011

DOUBLY-COATED IRON PARTICLES

Howard Rutz, Newtown, Pa., and Francis G. Hanejko, Marlton, N.J., assignors to Hoeganaes Corporation, Riverton, N.J.

Filed Jun. 12, 1989, Ser. No. 365,186

Int. Cl.[5] H01F *1/06;* B29C *43/02, 45/00*

U.S. Cl. 264—126 23 Claims

1. A method of doubly coating iron particles comprising the steps of:

treating the iron particles with phosphoric acid to form a layer of hydrated iron phosphate at the surface of the iron particles;

heating the iron particles in an inert atmosphere at a temperature and for a time sufficient to convert the hydrated layer to an iron phosphate layer; and

coating said particles with a thermoplastic material that is a polyethersulfone or a polyetherimide to provide a coating of said thermoplastic material substantially uniformly circumferentially surrounding said iron phosphate layer, wherein sufficient thermoplastic material is used to provide a coating that constitutes from about 0.2% to about 15.0% by weight of the doubly-coated particles.

7. A mixture of doubly-coated iron particles for molding high frequency magnetic components wherein said coated iron particles comprise:

iron core particles having a weight average paticle size of about 20–200 microns;

a layer of iron phosphate at the surface of the iron core particles; and

a substantially uniform circumferential coating of a thermoplastic material that is a polyethersulfone or a polyetherimide surrounding the iron phosphate layer, said thermoplastic material constituting about 0.2% to about 15.0% by weight of said particles.

14. A method of making high frequency magnetic components comprising the steps of:

(a) providing a mixture of doubly-coated iron particles comprising:

(1) iron particles;

(2) a layer of iron phosphate at the surface of the iron particles; and

(3) a coating of a thermoplastic material that is a polyethersulfone or a polyetherimide surrounding the iron phosphate layer, said thermoplastic material constituting about 0.2% to about 15.0% by weight of said doubly-coated particles; and

(b) molding the mixture of doubly-coated iron particles into a magnetic component having a density that is at least about 96.5% of theoretical density.

5,063,012

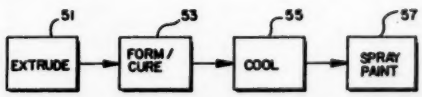
METHOD OF MANUFACTURING ELASTOMERIC ENGINE COMPONENTS

Robert M. Gibbon, Fort Worth, Tex., assignor to JMK International, Inc., Ft. Worth, Tex.

Filed Nov. 6, 1989, Ser. No. 432,081

Int. Cl.[5] B05D *1/02;* B29C *35/02*

U.S. Cl. 264—129 6 Claims



1. A method for reducing the degrading effect of radiant heat in excess of 500° F. upon an elastomeric component used in the engine compartment of a vehicle during the vehicle operation, the method comprising the steps of:

forming the elastomeric component into the desired shape;

at least partially curing the elastomeric component;

spray painting the exterior of the elastomeric component with a heat reflecting, heat resistant paint to form a reflective surface thereon, the reflective surface being effective to reduce the effects of radiant heat present in the surrounding environment to thereby improve the life expectancy of the component; and

wherein the heat reflecting, heat resistant paint is an aluminum containing silicone paint which is heat resistant in the temperature range from about 500°–650° F.

5,063,013

VISE

Börje K. H. Ramsbro, Djursholm, Sweden, assignor to System 3R USA, Inc., Pompton Plains, N.J.

Continuation of Ser. No. 252,038, Sep. 30, 1988, Pat. No. 4,925,168, which is a continuation of Ser. No. 839,947, Mar. 17, 1986, abandoned. This application May 9, 1990, Ser. No. 508,423

Claims priority, application Sweden, Mar. 18, 1985, 8501309

The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.

Int. Cl.[5] B23Q *3/02*

U.S. Cl. 269—136 12 Claims

1. A vise comprising

a base plate,

a first gripping jaw extending vertically from said base plate and being fixed in position with respect to said base plate,

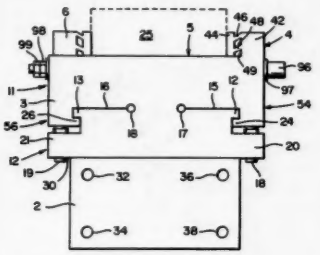
a first clamping plate connected to said first gripping jaw,

a second gripping jaw rising above and being movably guided on said base plate,

a second clamping plate connected to said second gripping jaw, said second gripping jaw being rotatably connected to a spindle, said spindle being rotatably secured to said

base plate, said spindle extending in a longitudinal channel formed in said base plate and being surrounded in the longitudinal channel by a guiding portion of the second gripping jaw, said guiding portion being connected to the second gripping jaw by a neck caught in a longitudinal slot of the base plate,

a flat reference face extending transversely to and between the first and second clamping plates and being formed on relatively thin side walls of the base plate that define the longitudinal channel,



said side walls including at least two adjacent abutment surfaces extending in the direction of the reference face, a first of said abutment surfaces being inclined relative to the reference face and the second of said abutment surfaces being inclined oppositely relative to the first abutment surface, and

at least two abutting surfaces formed on said second gripping jaw and adjacent to the abutment surfaces, a first of the abutting surfaces extending parallel to a first of the abutment surfaces and a second of the abutting surfaces extending parallel to a second of the abutment surfaces.

5,063,014

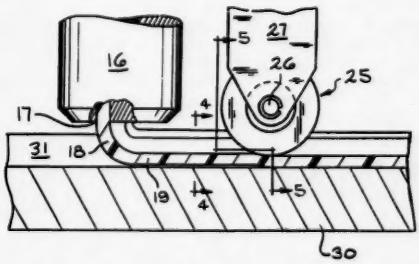
METHOD FOR MOLDING TRIM STRIPS BY EXTRUSION MOLDING IN AN OPEN MOLD

Mehmet Y. Cakmakci, Rochester Hills, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed May 7, 1990, Ser. No. 520,306

Int. Cl.[5] B29C *43/08*

U.S. Cl. 264—151 **17 Claims**



2. A method for molding a decorative plastic strip extending from a leading end to a trailing end and having an inner surface and an outer surface and a pair of edges joining said inner and outer surfaces comprising the steps of:

extruding a ribbon of heated and moldable plastic material into an open-faced mold cavity extending from a first end defining said leading end to a second end defining said trailing end, said mold cavity having a molding surface defining the desired configuration of said outer surface, said edges and said leading and trailing ends of the finished strip;

contacting said ribbon while in heated moldable condition with a shaping element;

imparting relative movement between said shaping element and said mold to sequentially compress incremental segments of said ribbon into conformity with said molding surface from said first end to said second end while shaping opposing portions of said incremental segments with said shaping element.

5,063,015

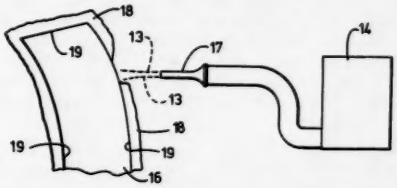
METHOD FOR DEFLASHING ARTICLES

Daniel L. Lloyd, Mason, and Eugene L. Cooke, Cincinnati, both of Ohio, assignors to Cold Jet, Inc., Loveland, Ohio

Continuation of Ser. No. 322,368, Mar. 13, 1989, abandoned. This application Jul. 24, 1990, Ser. No. 559,491

Int. Cl.[5] B26F *3/00*; B29C *37/02*

U.S. Cl. 264—161 **1 Claim**



1. A method for removing flashing from reaction injection molded articles, comprising the steps of:

(a) providing a workpiece which has been formed by reaction injection molding, said workpiece having a surface and having a flashing, said flashing being connected to said workpiece along an edge of said workpiece;

(b) providing a substantially continuous flow of carbon dioxide pellets while controlling the density of said carbon dioxide pellets so as to prevent degradation of said surface of said workpiece, said carbon dioxide pellets being generally cylindrical in shape, said carbon dioxide pellets being made of compressed carbon dioxide snow flakes which have been extruded through a die; and

(c) directing said flow of carbon dioxide pellets at said workpiece along said edge so as to impact both said workpiece and said flashing and to cause said flashing to become disconnected from said workpiece at said edge.

5,063,016

PRODUCTION OF HARDWEARING AND SHOCK-RESISTANT EXTRUDATES OF ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE AND APPARATUS FOR THIS PURPOSE

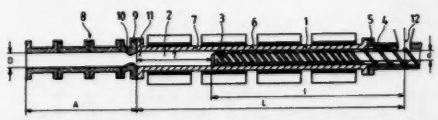
Peter Bauer, Ludwighsafen; Rainer Konrad, Goennheim; Herbert Morgenstern, Mannheim, and Horst Schuch, Ilvesheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 9, 1990, Ser. No. 520,768

Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915603

Int. Cl.[5] B29C *47/62*

U.S. Cl. 264—211.21 **2 Claims**



1. A method for producing hardwearing and shock-resistant extrudates of ultra-high molecular weight polyethylene

(UHMW-PE) having an intrinsic viscosity of from about 800 to about 3,500 cm^3/g, in which finely divided polyethylene or polyethylene powder is introduced into the cooled feed zone of a single-screw extruder and compressed therein, heated to 180°–280° C. in a transport zone of the extruder, transferred to the screw-free zone and discharged with shaping of the extrudate and cooling to a surface temperature of less than 150° C., wherein the polyethylene is processed in the transport zone using a velocity gradient of from 50 to 1,000 sec^{-1} in the radial play between the screw flight and the extruder barrel.

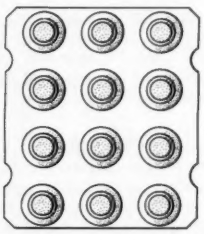
2. Apparatus for producing hardwearing and shock-resistant extrudates of ultra-high molecular weight polyethylene (UHMW-PE) having an intrinsic viscosity of from about 800 to about 3,500 cm^3/g, possessing a barrel which contains an inlet orifice and an outlet orifice at its ends and in whose cylindrical bore a screw is rotatable, the barrel having a coolable feed zone with grooves extending in the longitudinal direction and a heatable transport zone, and the ratio of the length L to the bore diameter D of the barrel being from about 15 to about 30 and the ratio of the length l to the nominal diameter d of the screw being from about 12 to about 20, so that a screw-free barrel section is formed downstream of the transport zone, the said section being connected to an outlet pipe A and being coolable in the region of the outlet orifice, wherein the screw is double-flighted in the region of the transport zone, and wherein the ratio of the length of the outlet pipe to the diameter of the outlet pipe is from about 4 to about 100.

5,063,017

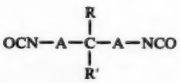
FLEXIBLE ARTICLES FORMED FROM POLYURETHANES BY RIM PROCESSES

Jae H. Choi, Carmel, Ind., assignor to AT&T Laboratories, Murray Hill, N.J.

Filed Mar. 30, 1990, Ser. No. 502,597
Int. Cl.[5] B29C *45/46*
U.S. Cl. 264—328.6 **7 Claims**



1. A process for forming a flexible article, said process comprising the steps of (1) introducing at least two reactive fluids into an injection mold, (2) directing said fluids into a cavity in said mold wherein said cavity defines the shape of said article and (3) allowing the composition resulting from the combination of said fluids to cure in said shape, wherein said fluids react to form said flexible article and include a polyol and an isocyanate represented by the formula:



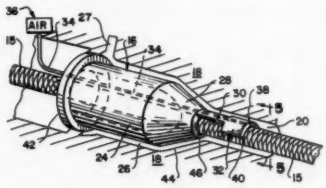
where R and R′ are independently hydrogen or lower alkyl and where A is a substituted or unsubstituted phenyl group and where a mole ratio of said polyol to said isocyanate is in the range 17:1 to 5:1.

5,063,018

EXTRUSION METHOD

Carlos A. Fontirroche, Coral Gables, and Csaba Truckai, Miami, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Filed Jun. 4, 1990, Ser. No. 532,626
Int. Cl.[5] B29C *47/20*
U.S. Cl. 264—514 **23 Claims**



1. An extrusion process for the manufacture of multiple lumen tubing, which comprises:

extruding an inner tube of molten plastic about metallic, bore-forming mandrel means; and

extruding about said inner tube an outer tube of molten plastic having a lumen formed by air mandrel means, with said inner and outer tubes being attached with the axis of said outer tube being parallel to but spaced from the axis of said inner tube.

12. In a mandrel for extrusion of tubing while the mandrel is positioned in an extrusion die that defines the outer diameter of tubing extruded through said die, said mandrel defining an extrusion head for positioning within said die, said head defining a distal end portion positioned and shaped to form a lumen in tubing extruded through said die, and an air flow passage extending through said mandrel to communicate with the lumen formed in said extruded tube for providing air mandrel means, the improvement comprising, in combination:

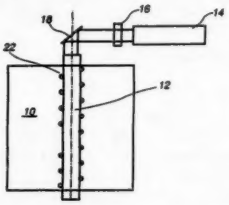
said distal end portion being carried by an intermediate neck portion of said mandrel, said neck portion having at least one transverse dimension that is less than the corresponding transverse dimension of said distal end portion, said distal end portion defining a transverse shoulder at its connection to the neck portion.

5,063,019

NUCLEAR REACTIVITY CONTROL USING LASER INDUCED POLARIZATION

Charles D. Bowman, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 357,248, May 26, 1989. This application May 23, 1990, Ser. No. 527,457
Int. Cl.[5] G21C *7/06*
U.S. Cl. 376—331 **4 Claims**



1. A control element for reactivity control of a fission source, comprising:

a volume of ^3He located in said fission source and having an atomic density of ^3He effective to control the reactivity of said fission source as said ^3He is spin-polarized;

an irradiation source for spin-polarizing said ^3He; and

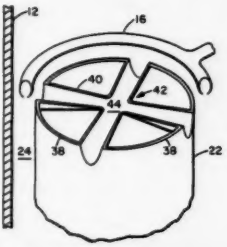
means for generating a guide magnetic field in said volume of ^3He and oriented along the direction of said spin-polarization effective to maintain said ^3He spin-polarization and concomitant fission source reactivity.

5,063,020

STEAM-WATER SEPARATING CONSTRUCTION FOR BOILING WATER NUCLEAR REACTORS

Douglas M. Gluntz, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed May 29, 1990, Ser. No. 529,795
Int. Cl.[5] G21C *15/16*
U.S. Cl. 376—371 **10 Claims**



1. A boiling water nuclear fission reactor having an improved steam-water separator system, consisting essentially of the combination of a reactor pressure vessel having an inlet for supplying coolant feedwater and an outlet for steam discharge and containing a core of fissionable fuel for producing heat to generate steam, said fuel core being mounted within the reactor pressure vessel and surrounded by an open ended cylindrical shroud which is spaced inward away from the pressure vessel to provide an annular flow path between the pressure vessel and he shroud surrounding the fuel core whereby supplied coolant feedwater together with recirculating liquid coolant feedwater together with recirculating liquid coolant can flow downward around the exterior of the shroud surrounding the fuel core and then around back upward through the shroud and fuel core for the transfer of thermal energy for the fuel core and generation of steam from liquid coolant and thereby producing a mixture of liquid water and steam vapor, a core upper plenum area superimposed above the fuel core and surrounded by an upper portion of the open ended cylindrical core shroud, and a steam-water separator adjoining and transferring the upper open end of the cylindrical core shroud comprising at least one three sided open top through briding horizontally across the upper open end of the cylindrical core shroud and extending outward through the uppermost edge portion of the open ended shroud whereby any fluid contents of a trough can flow outward there from at a level beneath the uppermost open edge of the core shroud into the annular flow path between the pressure vessel and the core shroud.

5,063,021

METHOD FOR PREPARING POWDERS OF NICKEL ALLOY AND MOLYBDENUM FOR THERMAL SPRAY COATINGS

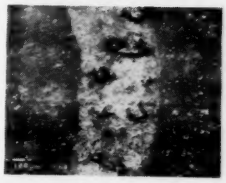
Vidhu Anand; Sanjay Sampath, both of Sayre; Clarke D. Davis, Wyalusing, and David L. Houck, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 23, 1990, Ser. No. 527,456
Int. Cl.[5] G22F *1/00*
U.S. Cl. 419—12 **9 Claims**

1. A method for preparing an intimate mixture of powders of nickel-boron-silicon alloy and molybdenum metal powder suitable for thermal spray coatings, said method comprising:

a) milling a starting mixture of said nickel-boron-silicon alloy and molybdenum powder to produce a milled mixture wherein the average particle size is less than about 10 micrometers in diameter;

b) forming an aqueous slurry of the resulting milled mixture and a binder selected from the group consisting of an



ammoniacal molybdate compound and polyvinyl alcohol; and

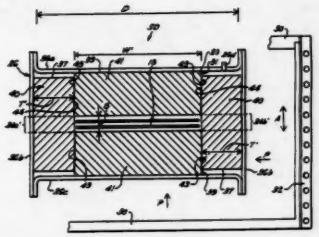
c) agglomerating said milled mixture and said binder to produce said intimate mixture.

5,063,022

METHOD FOR UNIAXIAL HIP COMPACTION

Daniel H. Zick, Andover, Mass., assignor to Industrial Materials Technology, Inc., Andover, Mass.

Filed Dec. 19, 1990, Ser. No. 631,083
Int. Cl.[5] G22F *1/00*
U.S. Cl. 419—49 **4 Claims**



1. A method for hot isostatic compaction of compactible material in a heated and pressurized environment within a pressure vessel, the method comprising

(a) placing a compaction die within a compaction container, the die having an interior wall area which defines within the die an internal cavity having a width measured along a first axis, and

(b) placing within the die cavity a compactible material charge and punch means for applying compaction force to

the compactible material charge, the punch means having a width essentially equal to the die cavity width such that when the punch means is loaded oriented along the first axis within the die cavity, respective ends of the punch means contact the die interior wall area, the die wall thickness being selected according to the degree of contact of the punch means with the die interior wall area,

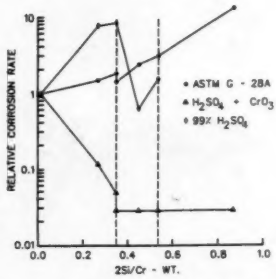
whereby, the loaded die is sealed within the container and the container is submitted to pressure in a pressure vessel, the submitted pressure forcing the punch means to travel transverse to the first axis to compact the loaded compactible material charge.

5,063,023

CORROSION RESISTANT NI- CR- SI- CU ALLOYS

Narasi Sridhar, Carmel, Ind., assignor to Haynes International, Inc., Kokomo, Ind.

Filed Nov. 17, 1989, Ser. No. 437,707
Int. Cl.[5] C22C 19/05
U.S. Cl. 420—442 **5 Claims**



1. A nickel-base alloy consisting essentially of, in weight percent, up to 1.5 aluminum, up to 0.06 carbon, up to 3 columbium, 11 to 29 chromium, up to 20 cobalt, 1 to 3 copper, up to 19 iron, up to 2 manganese, 1 to 6.5 molybdenum, up to 0.2 nitrogen, 3.5 to 6.5 silicon, up to 2 titanium, up to 2.5 tungsten and the balance nickel and normal impurities wherein the value $(20\text{-Fe})\times(\text{Si-3})$ is greater than 5.

5,063,024

METHOD AND APPARATUS FOR IMMUNOLOGICAL DETERMINATIONS

Paul Partanen; Helena Seppänen, both of Helsinki, and Hannu Harjunmaa, Espoo, all of Finland, assignors to Labsystems OY, Helsinki, Finland

Continuation of Ser. No. 53,859, May 13, 1987, abandoned. This application Jul. 10, 1989, Ser. No. 377,538
Int. Cl.[5] G01N 21/13
U.S. Cl. 422—65 **7 Claims**

1. An immunological assay equipment comprising:

a carriage (8) displaceable along a rectilinear path in a horizontal plane,

said carriage including a location area (20) for supporting a cuvette set (17) comprising a plurality of spaced cuvettes (18) of cylindrical shape,

said cuvette set (17) with its plurality of cuvettes (18) constituting a rectangular matrix in which the cuvettes are joined by means of a plate to provide said cuvettes in predetermined spaced apart relationship,

said carriage also including a location area (21) adjacent to area (20) for supporting samples,

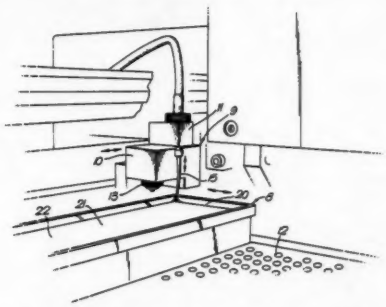
said location area (20) including a thermostated incubator having spaced heating pins (19) through which heat is conducted, said pin (19) being positioned to enter and occupy spaces between cuvettes (18) when said cuvette set is positioned in said incubator,

each of said heating pins (19) having a quadrangular shape with its sidewalls concaved to conform to the cylindrical walls of the cuvettes so that air can circulate freely between the cuvettes,

each of said cuvettes (18) having an antigen of an antibody or an antibody of an antigen immobilized onto inner faces of said cuvettes (18) of said cuvette set (7),

a dosage head (9) displaceable along said carriage (8) in a horizontal plane,

said displacement being along a rectilinear path perpendicular to said carriage path,



a single-tip liquid dosimeter (11) attached to dosage head (9) having a tip capable of being lowered onto the bottom of said cuvette (18) disposed beneath dosimeter (11),

a dosage equipment for passing liquid into cuvette (18) and removing solution therefrom via tip (15),

a measuring device (10) attached to dosage head (9) for measuring signals given by a trace agent adhering to inner faces of cuvettes (18),

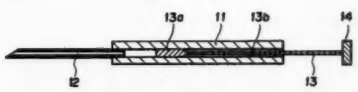
said assay equipment being fully automated so that cuvettes (18) placed therein may be dosed, incubated and their contents accordingly analyzed.

5,063,025

ANALYTICAL MICROSYRINGE WITH A SUPERELASTIC PLUNGER

Tatsuharu Ito, Tokyo, Japan, assignor to Ito Corporation, Shizuoka, Japan

Filed Feb. 20, 1990, Ser. No. 481,568
Int. Cl.[5] B01L 3/02; G01N 1/02; A61M 5/315
U.S. Cl. 422—100 **8 Claims**



1. An analytical microsyringe comprising:

a syringe body having an inner surface;

an injection needle fixed to the inner surface of said syringe body at one end of said syringe body;

a linear plunger formed of superelastic wire and having one end thereof formed to have a diameter large enough to tightly and slidably contact the inner surface of said syringe body and a portion thereof other than the large-diameter end formed to have a smaller diameter and keep clear of the inner surface of said syringe body; and

a knob integrally fixed to the other end of said linear plunger.

5,063,026

EGG COLLECTING APPARATUS

Johnson N. S. Wong, Rolling Hills, Calif., assignor to Evergreen Industries, Inc., Los Angeles, Calif.

Filed Jul. 11, 1990, Ser. No. 552,199
Int. Cl.[5] C12M *1/28;* A61B *10/00*
U.S. Cl. 422—102 8 Claims

1. An apparatus for the collection of parasitic eggs, comprising:

an adhesive strip having a first end, a second end, an adhesive side and a non-adhesive side;

a tab attached to the first end of the strip;

a shaft having an exterior surface adapted for receipt of the non-adhesive side of the strip;

the adhesive strip being removably wrapped around the exterior surface of the shaft with the adhesive side of the strip exposed and the tab overlapping the second end of the strip;

a gripping member; and

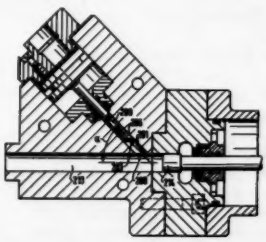
a connecting member having two ends, the connecting member being attached at one end to the shaft and connected at the other end to the gripping member.

5,063,027

APPARATUS FOR MIXING AT LEAST TWO REACTIVE PLASTIC MATERIALS

Fritz W. Schneider, Florence, Ky., assignor to Krauss-Maffei A.G., Fed. Rep. of Germany

Filed Jun. 20, 1989, Ser. No. 373,015
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1988, 3820810
Int. Cl.[5] C08F *2/00*
U.S. Cl. 422—133 15 Claims



1. An impingement mixing device comprising:

a mixing chamber housing;

a control piston axially displaceable within said mixing chamber housing between an extended position and a retracted position;

a mixing chamber within said housing defined by an end face of said control piston when in the retracted position and a mixing chamber discharge outlet coextensive with an end face of said control piston when in the extended position;

means for feeding a first component to said mixing chamber;

means for feeding a second component to said mixing chamber in opposing relationship to said first component; and

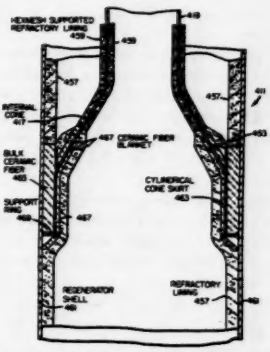
a discharge tube housing defining a quieting chamber communicating with said mixing chamber and having an opening at a discharge end, wherein said mixing chamber is arranged with a longitudinal axis at an acute angle, alpha, to a longitudinal axis of said quieting chamber.

5,063,028

PROCESS AND APPARATUS FOR REGENERATION OF FCC CATALYST

John D. Humble, Asheville, N.C.; Raymond C. Searles, Flemington, N.J.; John D. Ruggles, Surrey, England, and Judah L. Jacobowitz, Princeton, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 18, 1990, Ser. No. 525,503
Int. Cl.[5] F27B *15/04, 15/06;* B01J *8/28, 8/34*
U.S. Cl. 422—144 10 Claims



1. A catalyst regenerator apparatus for the high efficiency regeneration of fluidized catalytic cracking catalyst in a vessel having a vessel sidewall and comprising:

a combustor having an inlet for spent catalyst from a cracking reactor, an inlet for combustion air, an inlet for receiving recycled regenerated catalyst and an outlet in an upper portion of said combustor comprising an internal cone;

a riser communicating said combustor with a disengaging vessel, said riser being in axial alignment with said internal cone of said combustor and extending therefrom and in axial alignment with said disengaging vessel, said riser operatively connecting said combustor and said disengaging vessel and permitting transfer of catalyst and combustion gas from said combustor to said disengaging vessel;

said disengaging vessel located above and in axial alignment with said riser and said combustor, said disengaging vessel having a bottom comprising said internal cone, said disengaging vessel comprising means for receiving a mixture of regenerated catalyst and combustion gas discharged from said riser and for separating said mixture into a regenerated catalyst bed located at said bottom of said disengaging vessel and a flue gas phase which is removed from said disengaging vessel; and wherein said disengaging vessel comprises a regenerated catalyst outlet means connective with said cracking reactor and a regenerated catalyst recycle means connecting with said combustor;

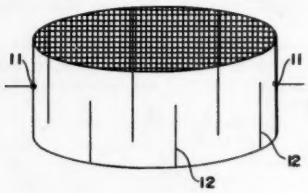
said internal cone having a downwardly extending cylindrical skirt spaced from the sidewall of said regenerator vessel and defining a cylindrical annular space intermediate said internal cone and said sidewall, and wherein said cylindrical skirt is fastened to said regenerator vessel by a support means.

5,063,029

RESISTANCE ADJUSTING TYPE HEATER AND CATALYTIC CONVERTER

Hiroshige Mizuno, Tajimi; Fumio Abe, Handa, and Takashi Harada, Nagoya, all of Japan, assignors to NGk Insulators, Ltd., Japan

Filed Jun. 29, 1990, Ser. No. 545,509
Claims priority, application Japan, Apr. 12, 1990, 2-96866
Int. Cl.[5] F01N *3/10;* **B01D** *53/36;* **H05B** *3/10*
U.S. Cl. 422—175 **16 Claims**



1. An heating element for heating fluid flowing therethrough, comprising:

an electrically conductive integral honeycomb structure having a periphery and two ends, including a plurality of passages which are defined by partition walls and extend in an axial direction between the ends, and at least one slit which is formed through said partition walls; and

at least two electrodes in electrical contact with said honeycomb structure;

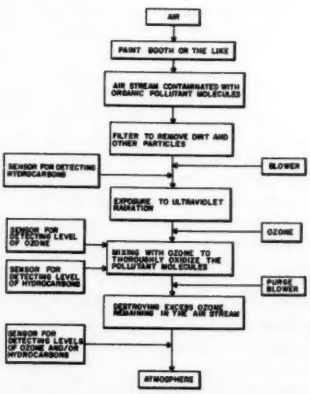
wherein said slit is disposed between said electrodes such that said slit interrupts current flow through portions of said honeycomb structure between said electrodes for heating said honeycomb structure and fluid flowing through said passages.

5,063,030

PROCESS AND APPARATUS FOR REMOVING ORGANIC CONTAMINANTS FROM A FLUID

Robert J. Sweetman, 4612 Thornhurst Dr., Olney, Md. 20832

Filed Mar. 8, 1990, Ser. No. 490,376
Int. Cl.[5] B01J *19/08, 19/12, 19/00*
U.S. Cl. 422—189 **20 Claims**


AIR
PAINT BOOTH OR THE LIKE
AIR STREAM CONTAMINATED WITH ORGANIC POLLUTANT MOLECULES
FILTER TO REMOVE DIRT AND OTHER PARTICLES
SENSOR FOR DETECTING HYDROCARBONS
BLOWER
EXPOSURE TO ULTRAVIOLET RADIATION
SENSOR FOR DETECTING LEVEL OF OZONE
OZONE
MIXING WITH OZONE TO THOROUGHLY OXIDIZE THE POLLUTANT MOLECULES
SENSOR FOR DETECTING LEVEL OF HYDROCARBONS
PURGE BLOWER
DESTROYING EXCESS OZONE REMAINING IN THE AIR STREAM
SENSOR FOR DETECTING LEVELS OF OZONE AND/OR HYDROCARBONS
ATMOSPHERE

1. A gas treatment apparatus for removing organic contaminants from a gas containing organic pollutant molecules having the characteristics of reacting generally reluctantly with an oxidizing agent at room temperature, the apparatus comprising:

(a) a contaminated gas collection chamber, a photoexcitation unit, a mixing chamber, and a catalytic bed oxidizing gas destruct unit;

(b) means for exhausting said contaminated gas from said collection chamber and feeding said contaminated gas into said photoexcitation unit;

(c) means for transferring said photoexcited gas into said mixing chamber;

(d) said mixing chamber including means for supplying an oxidizing gas into said mixing chamber for reacting with said photoexcited gas to produce a substantially organic contaminants free gas;

(e) means for transferring said substantially organic contaminants free gas into said catalytic oxidizing gas destruct unit for reacting with a catalyst therein to break down substantially all of any excess oxidizing gas that may exist in said organic contaminants free gas; and

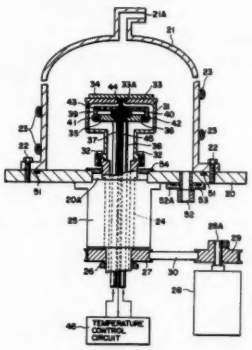
(f) means for venting said catalytically treated organic contaminants free gas.

5,063,031

APPARATUS FOR GROWING VAPOR PHASE LAYER ON SEMICONDUCTOR SUBSTRATE

Mitsuo Sato, Zama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 21, 1990, Ser. No. 570,555
Claims priority, application Japan, Aug. 24, 1989, 1-217845
Int. Cl.[5] F16K *1/16;* **C23C** *16/52*
U.S. Cl. 422—245 **6 Claims**



1. A chemical vapor deposition apparatus for rowing a vapor-phase deposition layer on a semiconductor substrate, comprising:

a base plate having opposed surfaces;

a container to be attached to and removed from one surface of the base plate, and to establish a chamber to be supplied with a gas;

a bearing secured to the other surface of the base plate;

a hollow shaft rotatably supported by the bearing, one end portion of said shaft extending into said chamber through said base plate;

driving means for rotating the shaft;

a casing arranged in the chamber, said casing being open at one end and mounted at the other end thereof to said one end portion of the shaft;

a susceptor in the open one end of the casing, said susceptor having a supporting surface on which a semiconductor substrate is to be placed and a concave recess opposite from said supporting surface;

a heat generator arranged in the casing for heating the susceptor and semiconductor substrate;

a conductive support for supplying power to and supporting said heat generator, said conductive support extending through said hollow shaft to said casing;

means for detecting the temperature of said heat generator, said detecting means extending through said hollow shaft to a distal end portion located in the concave recess of said susceptor; and

control means for controlling the temperature of the heat generator in response to temperatures detected by the detecting means.

5,063,032

METHOD OF PREPARING A SYNTHETIC RUTILE FROM A TITANIFEROUS SLAG CONTAINING MAGNESIUM VALUES

Michel Gueguin, Tracy, Canada, assignor to QIT-Fer et Titane, Inc., Montreal, Canada

Filed Mar. 27, 1990, Ser. No. 499,888

The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.

Int. Cl.[5] C01G *23/00*

U.S. Cl. 423—84 **26 Claims**

1. A method for upgrading the content of TiO_2 in a titaniferous slag, the titaniferous slag containing FeO, Ti_2O_3 and at least 1.0 weight percent MgO, and the molecular ratio of Ti_2O_3 to FeO being at least about 1, the method comprising:

contacting the titaniferous slag with chlorine gas at a temperature of at least about 800° C. such that the slag is chlorine-treated and $FeCl_2$ is formed; and

contacting the chlorine-treated slag with hydrochloric acid such that $MgCl_2$ is formed and the slag is hydrochloric acid-treated.

5,063,033

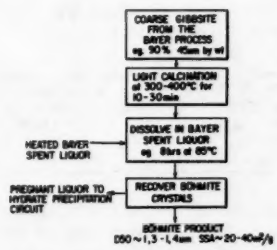
PROCESS FOR THE PRODUCTION OF BOEHMITE

Neil Brown, Bonn, Fed. Rep. of Germany, assignor to Vereinigte Aluminum-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany

Filed Feb. 10, 1987, Ser. No. 13,009

Int. Cl.[5] C01F *7/02, 7/22*

U.S. Cl. 423—112 **10 Claims**


COARSE GIBBSITE FROM THE BAYER PROCESS
LIGHT CALCINATION
DISSOLVE IN BAYER SPENT LIQUOR
HEATED BAYER SPENT LIQUOR
RECOVER BOHMITE CRYSTALS
PREGNANT LIQUOR TO HYDRATE PRECIPITATION CIRCUIT
BOHMITE PRODUCT

1. A process for producing boehmite crystals comprising:

calcinating gibbsite particles at a temperature above 300 degrees C to lower L.O.I. to less than 20% to produce boehmite particles embedded in a matrix material, the matrix material being essentially chi-alumina and essentially free of gibbsite, gamma-alumina and alpha-alumina;

dissolving the matrix material in a caustic aluminate liquor, at atmospheric pressure and at a temperature of from about 60°–120 degrees C to liberate the boehmite particles; and,

recovering boehmite particles essentially free of gibbsite, gamma-alumina and alpha-alumina and having an average particle size of between 1 and 2 micrometers and a specific surface area of 13 to 57 m^2/gram.

5,063,034

PROCESS FOR PURIFYING BY THE WET METHOD FUMES CONTAINING NITROGEN OXIDES

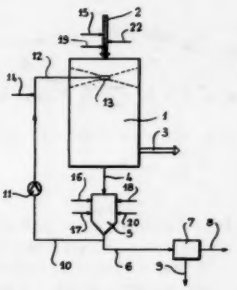
Jean-Francois Vicard, Lyons, France, assignor to Societe LAB, Lyons, France

Filed Feb. 13, 1990, Ser. No. 479,517

Claims priority, application France, Feb. 23, 1989, 89 02617

Int. Cl.[5] C01B *21/00*

U.S. Cl. 423—235 **8 Claims**



1. A process for purifying fumes resulting from a combustion process wherein the fumes contain nitrogen oxides and in which the fumes are purified to remove the nitrogen oxides by the wet method in a washer and wherein the fumes are scrubbed by recycling an aqueous washing liquid a portion of which is drained for removal of the pollutants trapped therein,

wherein the process comprises the following combination of steps:

a) introducing into the washing liquid, before the introduction thereof into the washer to contact the fumes, an oxidation compound of sodium chlorite of which the products of reaction with an acid agent are oxidizing agents;

b) introducing into the fumes, before the introduction thereof into the washer to contact the washing liquid containing said oxidation compound therein, a hydrochloric acid agent which is easily soluble and which reacts with said oxidation compound and of which the product of reaction therewith is an oxidizing agent which converts NO to NO_2 as the fumes are contacted with the washing liquid within the washer;

c) introducing a reducing agent into the washing liquid so that the reducing agent is in the washing liquid when the fumes are contacted within the washer with said washing liquid while NO is converted to NO_2;

d) and introducing into the washing liquid an intermediate agent oxidizable by NO_2 so that nitrates are not formed and NO_2 is converted to N_2, and thereafter the oxidized form of the intermediate agent is regenerated from the oxidized form by reduction with said reducing agent as the fumes are contacted with the recycling washing liquid within the washer.

5,063,035

ENHANCED PERFORMANCE OF ALUMINA FOR THE REMOVAL OF LOW-LEVEL FLUORINE FROM GAS STREAMS

Paul S. Leondaridis, Paris, France; William A. Von Drasek, Burbank, and Gregory M. Jursich, Clarendon Hills, both of Ill., assignors to American Air Liquide, New York, N.Y.

Filed Apr. 23, 1990, Ser. No. 512,410

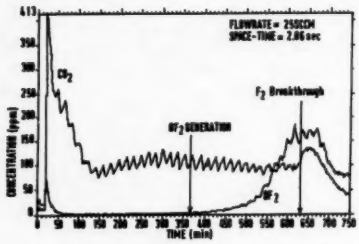
Int. Cl.[5] C01B *7/20*; B01D *53/34*

U.S. Cl. 423—241 **7 Claims**

1. A method of removing fluorine from gas streams, consisting essentially of:

conducting a gas stream containing fluorine over an alumina

having chromium oxide absorbed thereon thereby effectively eliminating fluorine from the gas while substantially



preventing the formation of toxic oxygen difluoride by-product.

5,063,036

PROCESS FOR PRODUCING PHASE-STABILIZED AMMONIUM NITRATE

Walter Engel, Wöschbach; Norbert Eisenreich, Pfinztal, and Klaus-Dieter Thiel, Karlsruhe, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angenwandten Forschng e.V., Munich, Fed. Rep. of Germany

Filed Jun. 22, 1990, Ser. No. 542,059

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1989, 3921098

Int. Cl.[5] C01C *1/18*

U.S. Cl. 423—266 **9 Claims**

9. Process for producing phase-stabilized ammonium nitrate (AN) by incorporating a diammine complex of Ni or Cu into the AN lattice, comprising mixing CuO or Ni_2O_3 with the total AN quantity and heating the mixture to 110° to 170° C. for a time sufficient to produce said diammine complex in a solid-state reaction of CuO or Ni_2O_3 and AN and to directly incorporate the diammine complex into the AN lattice.

5,063,037

CRYSTALLINE BOROSILICATE

Mae K. Rubin, Bala Cynwyd, Pa., assignor to Mobil Oil Corp., Fairfax, Va.

Continuation of Ser. No. 647,506, Sep. 5, 1987, abandoned. This application Sep. 24, 1986, Ser. No. 913,541

Int. Cl.[5] C01B *33/34, 35/12*

U.S. Cl. 423—277 **6 Claims**

1. A synthetic porous crystalline borosilicate zeolite having a silica to B_2O_3 molar ratio of from about 5 to about 500, said porous crystalline material in the uncalcined state being characterized by an x-ray diffraction pattern having values substantially as set forth in Table 1 of the specification.

5,063,038

ZEOLITE SYNTHESIS USING AN ALCOHOL OR LIKE MOLECULE

Garry W. Kirker, Washington Township, Gloucester County; Donald J. Klocke, Somerdale, both of N.J.; James C. Vartuli, West Chester, Pa.; Pochen Chu, West Deptford, N.J.; David O. Marler, Deptford, N.J., and John P. McWilliams, Woodbury, N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 789,609, Oct. 21, 1985. This application Aug. 31, 1987, Ser. No. 91,612

Int. Cl.[5] C01B *33/34*

U.S. Cl. 423—328 **20 Claims**

1. A method for synthesizing a zeolite having the structure of ZSM-23, said method comprising the steps of:

(i) preparing an aqueous reaction mixture capable of forming said ZSM-23 zeolite, said reaction mixture comprising a source of silica, a source of alumina and a mixed organic directing agent comprising (a) an amine which is pyrrolidine and (b) an alcohol and/or a diol, wherein said alcohol or diol contains 1 to 6 carbon atoms;

(ii) maintaining said reaction mixture at a sufficient temperature to crystallize said zeolite; and

(iii) recovering said zeolite.

5,063,039

SYNTHESIS OF KENYAITE-TYPE LAYERED SILICATE MATERIAL AND ITS POLYMERIC CHALCOGENIDE INTERCALATES

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 245,607, Sep. 19, 1988, abandoned. This application Nov. 9, 1989, Ser. No. 434,951

Int. Cl.[5] C01B *33/28;* **B01J** *21/00*

U.S. Cl. 423—329 **21 Claims**

1. A method for synthesizing crystalline Kenyaite-type silicate which comprises (i) preparing a mixture capable of forming said silicate, said mixture comprising sources of alkali metal cations (AM), silicon, non-alkali metal (M) of valence n selected from the group consisting of metals of Periodic Table Groups III A, IV B, IV A, VI B and VIII, water and organic agent (R) selected from the group consisting of alkylamine, trialkylamine, a tetraalkylammonium compound and trimethylhexamethylene diamine, said alkyl having 1 to about 12 carbon atoms, and having a composition, in terms of mole ratios, within the following ranges:

SiO_2/M_mO_n	at least about 40
H_2O/SiO_2	5 to 200
OH^-/SiO_2	0 to 5
AM/SiO_2	0.05 to 3
R/SiO_2	0.01 to 3

(ii) maintaining said mixture under sufficient conditions until crystals of said silicate are formed and (iii) recovering said crystalline Kenyaite-type silicate.

11. A method for preparing a pillared layered silicate material intercalated with a polymeric chalcogenide which comprises:

providing a crystalline silicate material characterized by an X-ray diffraction pattern exhibiting values substantially as set forth in Table 1 of the specification;

enhancing the interlamellar distance of said layered silicate by impregnating the layered silicate with an organic compound capable of forming a cationic species;

introducing between the layers of said impregnated layered silicate a compound capable of conversion to said chalcogenide and converting said compound to said chalcogenide.

20. The product of the method of claim 11.

5,063,040

METHOD FOR INCREASING THE YIELD OF TRICHLOROSILANE IN THE FLUIDIZED-BED HYDROCHLORINATION OF SILICON

Klaus Ruff, Troisdorf, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 325,545, Mar. 20, 1989, abandoned. This application Jan. 23, 1990, Ser. No. 467,286

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809784

Int. Cl.[5] C01B *33/107*

U.S. Cl. 423—342 5 Claims

1. The method of increasing the content of trichlorosilane in the mixture of chlorosilanes produced by the hydrochlorination of silicone in a fluidized-bed reactor at a temperature between 300° and 1000° C., which comprises fluidized silicon dust in said reactor with gaseous hydrogen chloride, cooling the mixture of hot reaction gases formed thereby within less than one second after leaving the fluidized bed to a temperature which

a) is either no higher than 550° C. if the reaction temperature in the fluidized bed is above 550° C., or

b) is at least 100° C. lower than the reaction temperature in the fluidized bed, if the latter is 550° C. or less, and recovering the mixture of chlorosilanes.

5,063,041

PROCESS FOR THE REDUCTION OF PERCHLORATE IN ELECTROLYTES USED FOR THE PRODUCTION OF CHLORATE

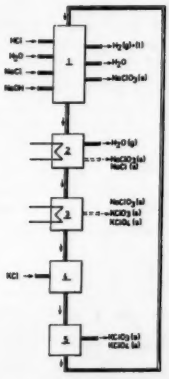
Carl J. F. Wanngård, Sundsvall, Sweden, assignor to Eka Nobel AB, Surte, Sweden

Filed Dec. 27, 1989, Ser. No. 457,589

Claims priority, application Sweden, Dec. 28, 1988, 8804675

Int. Cl.[5] C01B *11/18, 11/14;* C25B *1/28, 1/24*

U.S. Cl. 423—476 16 Claims



1. In a process for the production of sodium chlorate and byproduct sodium perchlorate which includes the steps of electrolyzing an aqueous electrolytic solution of sodium chloride in an electrolyzer, transferring the electrolytic solution to one or more reaction vessels for further reaction, recovering sodium chlorate from the electrolytic solution in the electrolyzer, and recycling at least a portion of the electrolytic solution to the electrolyzer, the improvement comprising:

(a) diverting at least a portion of the electrolytic solution from the process and evaporating water from the diverted portion to thereby reduce its liquid volume and form a precipitate, the precipitate optionally being separated from the liquid, the evaporation increasing the concentration of sodium perchlorate in the diverted portion;

(b) cooling the diverted portion of solution from step (a) to a temperature of between about 30° C. and about 0° C., a precipitate thereby being formed and optionally being separated from the cooled solution, the concentration of sodium perchlorate in the cooled solution being at least about 40 g/l;

(c) adding potassium chloride solution to the cooled solution from step (b), and converting soluble sodium perchlorate in the cooled solution to insoluble potassium perchlorate via metathesis with the added potassium chloride, the potassium perchlorate thereby precipitating, the potassium chloride solution having a concentration of from about 1.0 mole/l up to the saturation concentration and being at a temperature of between about 0° and about 50° C., the volume of the added potassium chloride solution containing from about 20% to about 120% of the potassium needed for precipitating the maximum amount of potassium perchlorate that can be selectively precipitated; and

(d) separating the solution from step (c) from the potassium perchlorate precipitate, and recycling the separated solution to the non-diverted portion of the electrolytic solution;

wherein said step of recovery of sodium chlorate occurs separately from the recovery of potassium perchlorate in step (d); and

wherein the concentration of sodium perchlorate in the electrolytic solution of the sodium chlorate process is less than about 40 g/l.

5,063,042

PROCESS FOR THE PRODUCTION OF CARBON FIBERS

Yoshikazu Arita; Toshi Iizuka, both of Takasaki; Yukio Abe, Maebashi; Yoshio Nakamura, Kiryu; Shoji Takigami, Kiryu, and Machiko Takigami, Kiryu, all of Japan, assignors to Gunei Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 7, 1989, Ser. No. 447,046

Claims priority, application Japan, Feb. 17, 1989, 1-39113

Int. Cl.[5] D01F *9/20*

U.S. Cl. 423—447.4 8 Claims

1. A process for the production of carbon fibers, comprising the steps of:

(a) providing novolak resin fibers;

(b) impregnating said novolak resin fibers with a polymerizable vinyl monomer;

(c) polymerizing said vinyl monomer and swelling said fibers;

(d) carbonizing said novolak resin fibers containing the polymerized vinyl monomer; and

(e) activating said carbonized fibers.

5,063,043

PROCESS IN THE PRODUCTION OF HYDROGEN PEROXIDE

Erik A. Bengtsson, Surte, Sweden, assignor to Eka Nobel AB, Surte, Sweden

Filed Feb. 23, 1990, Ser. No. 483,770

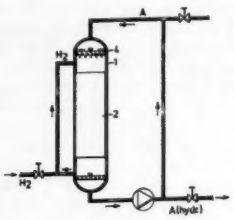
Claims priority, application Sweden, Feb. 23, 1989, 8900636

Int. Cl.[5] C01B *15/023*

U.S. Cl. 423—588 11 Claims

1. A process for the production of hydrogen peroxide according to the anthraquinone process by alternate reduction and oxidation of a working solution of alkylated anthraquinones, the hydrogenation of said working solution being conducted continuously with hydrogen gas or hydrogen gas-containing gas in a vertical monolithic fixed bed reactor at a temperature below 100° C. and a pressure below 1.5 MPa, wherein said working solution is supplied at the upper end of the reactor and uniformly distributed across the surface of the catalyst bed, while simultaneously introducing hydrogen gas or hydrogen gas-containing gas to the upper end of the reactor, the flow of said working solution through the catalyst bed being adjusted such that the liquid flow is lower than the falling rate of the liquid through the bed, whereby gas plugs are formed

which have a diameter close to the diameter of the catalyst channels, and whereby said gas plugs and corresponding liquid



plugs alternately and automatically flow downwardly through said channels and a plug flow is obtained.

5,063,044

CARBOXY AND CARBOXY-GLYCOL ETHER AND ESTER FUNCTIONAL SILOXANE CONTAINING HAIR CONDITIONERS AND SHAMPOOS

Gretchen S. Kohl; Patricia A. Giwa-Agbomeirele, and Judith M. Vincent, all of Midland County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 16, 1990, Ser. No. 481,003
Int. Cl.[5] A61K *7/075, 7/08, 7/09, 7/13*
U.S. Cl. 424—70 **7 Claims**

1. A hair conditioning composition comprising a mixture of a carrier, a thickener, and an organosilicon conditioning compound, the organosilicon conditioning compound being a carboxy-glycol ether or ester functional polysiloxane having the formula

$$QMe_2SiO(Me_2SiO)_x(MeRSiO)_y(MeR'SiO)_zSiMe_2Q$$

wherein

Me is a methyl radical;

R is a carboxyfunctional radical selected from the group consisting of carboxyalkyl radicals and carboxythioalkyl radicals;

R′ is selected from the group consisting of glycol ether groups having the formula $—(CH_2)_3—O(CH_2CH_2O)_a—R''$ and glycol ester groups having the formula $(CH_2)_3—O(CH_2CH_2O)_a—COR''$ in which a is an integer of from one to about one hundred and R″ is selected from the group consisting of hydrogen and alkyl radicals having one to four carbon atoms;

Q is selected from the group consisting of R, Me, and OH; and

x, y and z are each integers from one to above five thousand.

5,063,045

METHOD FOR EVALUATING ANTIALLERGIC SUBSTANCES

Akio Namimatsu, and Kouichiro Go, both of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 9, 1990, Ser. No. 506,039
Claims priority, application Japan, Apr. 10, 1989, 1-91578
Int. Cl.[5] A61K *49/00*
U.S. Cl. 424—9 **6 Claims**

1. A method for evaluating the efficacy of an antiallergic substance, which comprises administering the antiallergic substance to an animal with nasal mucosal hypersensitivity, and measuring the amount of nasal secretion quantitatively by means of a nasal thread.

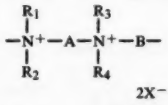
5,063,046

DENTIFRICE COMPOSITIONS HAVING ANTI-CARIES ACTIVITY AND CONTAINING A POLYCATIONIC POLYMER FLUORIDE

Jean-François Grollier, Paris, France, assignor to L'Oreal, Paris, France

Filed May 17, 1990, Ser. No. 524,316
Claims priority, application France, May 18, 1989, 89 06500
Int. Cl.[5] A61K *7/16, 7/18, 7/22, 31/785*
U.S. Cl. 424—52 **22 Claims**

1. A dentifrice composition containing, as an anti-caries agent, at least one water-soluble polycationic polymer having is part of the macrochain and having at least 5% of the cationic charges balanced by fluoride anions, said polycationic polymer comprising units of formula I



(I)

wherein

R_1, R_2, R_3 and R_4, each independently, represent an aliphatic, alicyclic or arylaliphatic group, optionally substituted, containing a maximum of 20 carbon atoms, or a hydroxyaliphatic group having 1–8 carbon atoms; or one or both of the pairs of substituents, R_1 and R_2, and R_3 and R_4, attached to a same nitrogen atom represent together a divalent group forming, with the nitrogen atom to which they are attached, a heterocycle capable of containing one or more heteroatoms other than nitrogen; or one or both of the pairs, R_1 and R_3, and R_2 and R_4, together form a divalent group linking two consecutive nitrogen atoms, represented in the unit of formula I, to which they are attached respectively;

A and B, each independently, represent (1) linear or branched alkylene having 1–20 carbon atoms, optionally unsaturated, the said alkylene group being able to be substituted and/or interrupted by one or more heteroatoms, and/or by one or more heteroatomic groups and/or by one or more aliphatic or aromatic rings or by one or more heterocycles; (2) a cycloalkylene group, optionally substituted and/or optionally having double bonds, containing up to 20 carbon atoms; (3) one or more arylene groups having 6 to 20 carbon atoms, the said arylene groups being optionally substituted and/or separated by one or more heteroatoms and/or by one or more heteroatomic groups or by one or more alkylene groups and/or by one or more aliphatic rings and/or by one or more heterocycles; and

X^- represents an anion, with the proviso that in the said composition at least 5%, in number, of the anions present in the polycationic polymer, having units of formula I, are fluoride ions.

5,063,047

Patent Not Issued For This Number

5,063,048

UV LIGHT-ABSORBING SKIN-PROTECTING COMPOSITION

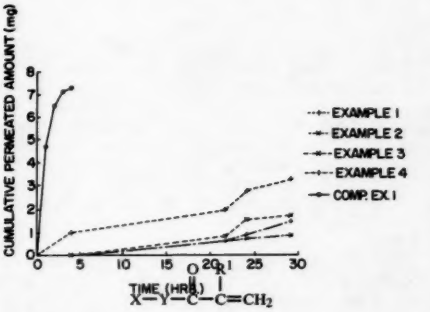
Izumi Saitoh, Nishinomiya, and Yoshio Sasaki, Takefu, both of Japan, assignors to Shionogi & Co., Ltd., Osaka and Nisshin Chemical Industry Co., Ltd., Fukui, both of, Japan

Filed Jul. 10, 1990, Ser. No. 550,540
Claims priority, application Japan, Jul. 10, 1989, 1-177714
Int. Cl.[5] A61K *7/42;* **C08F** *226/06*
U.S. Cl. 424—59 **10 Claims**

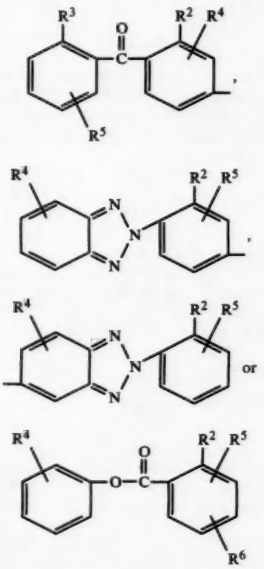
1. A UV light-absorbing skin-protecting composition which comprises:

an acrylic copolymer comprising

(A) 1 to 15% by weight of a compound of the formula:



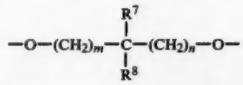
wherein R^1 is a hydrogen atom or a methyl group, X is a group of the formula:



in which

R^2 is a hydroxy group, R^3 is a hydrogen atom or hydroxy group, R^4 and R^5 are the same or different and each is a hydrogen atom, a lower alkyl group, a lower alkoxy group, a halogen atom, a nitro group, a carboxyl group, a sulfonic acid group or a sulfonamide group, and R^6 is a single bond or a methylene group,

Y is —O—, —NH— or a group of the formula:



in which R^7 is a hydrogen atom or a lower alkyl group, R^8 is a hydrogen atom or a hydroxy group, and m and n are the same or different and each is 0 and 1,

(B) 40 to 75% by weight of an alkyl acrylate,

(C) 10 and 40% by weight of an alkyl methacrylate, and

(D) 5 to 30% by weight of a monoethylenically unsaturated monomer having a carboxyl group;

and a medium.

5,063,049

DISINFECTANT NAIL POLISH REMOVER

Calvert Billings, 23221 Peralta, Ste. H, Laguna Hills, Calif. 92653

Filed Jun. 11, 1990, Ser. No. 535,512
Int. Cl.[5] A61K *7/04*
U.S. Cl. 424—61 **5 Claims**

1. A process for reducing infections located in an area adjacent a nail plate, by reducing fungus, bacteria and mold growth, by applying to the said area a blend of an acetone based nail polish remover to remove nail polish lacquer therefrom in a carrier solution of: parachlormetaxylenol: about 3–4 parts; thymol: about 3–4 parts; butyl acetate: about 30–50 parts; ethyl acetate: about 30–50 parts; and, isopropyl alcohol: about 15–25 parts.

5,063,050

TABLETED POWDER COSMETICS

Debra Verdon, Leonardo, N.J.; Marlene Tietjen, New York, and Ivonne Brown, Roosevelt, both of N.Y., assignors to Revlon, Inc., New York, N.Y.

Filed Mar. 23, 1990, Ser. No. 498,298
Int. Cl.[5] A61K *7/02, 7/021, 7/035*
U.S. Cl. 424—63 **8 Claims**

1. A cosmetic powder composition compression molded into a pressed tablet form at a compression ratio of between 2:1 to 4:1, comprising, in percent by weight:

about 10 to 80% talc,

about 0.1 to 20% aluminum starch octenylsuccinate

about 0.1 to 20% of a powdered sorbent agent selected from the group consisting of calcium silicate, silica, sodium silicate, magnesium silicate, aluminum silicate, bentonite, organomodified bentonite, hectorite, kaolinite, diate, nacrite, metahalloysite, pyrophyllite, and montmorillonite, and

about 0.1 to 20% of a liquid binder.

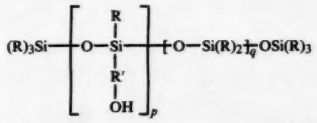
5,063,051

COSMETIC HAIR-CARE COMPOSITION BASED ON POLYORGANOSILOXANES CONTAINING A HYDROXYALKYL FUNCTIONAL GROUP

Jean F. Grollier, Paris; Claude Dubief, Le Chesnay, and Christine Dupuis, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 7, 1989, Ser. No. 376,742
Claims priority, application Luxembourg, Jul. 12, 1988, 87273
Int. Cl.[5] A61K *7/06, 7/08*
U.S. Cl. 424—70 **14 Claims**

1. Cosmetic hair-care composition, which contains, in a cosmetically acceptable medium, a polyorganosiloxane containing a hydroxyalkyl functional group corresponding to the following formula (I):



(I)

in which the radicals R, which are identical or different, are chosen from methyl and phenyl radicals, at least 60 mol % of the radicals R being methyl radicals, the radical R′ is a linear or branched divalent alkylene hydrocarbon chain containing from 2 to 18 carbon atoms, p is an integer between 1 and 30

inclusive, q is an integer between 1 and 120 inclusive, in sufficient proportions to impart to the hair good sheen properties combined with a light and full appearance, said composition containing no anionic surfactant in concentrations more than 5% by weight based on the total weight of the composition which confer foaming properties to the composition.

5,063,052

COSMETIC AND DERMATOLOGICAL APPLICATION OF POLYSILOXANES CONTAINING A DIESTER FUNCTIONAL GROUP AND COMPOSITIONS EMPLOYED

Jean F. Grollier, Paris, and Claude Dubief, Le Chesnay, both of France, assignors to L'Oreal, Paris, France

Filed Sep. 26, 1989, Ser. No. 412,788
Claims priority, application Luxembourg, Sep. 28, 1988, 87350
Int. Cl.[5] A61K *7/06*
U.S. Cl. 424—70 **21 Claims**

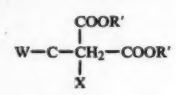
1. A cosmetic or dermatological composition which contains in a cosmetically or physiologically acceptable medium, at least one diorganopolysiloxane containing a diester functional group, carrying, per molecule at least one unit of formula:

$$ZR_aSiO_{(3-a)/2} \quad (I)$$

in which:

a is 0, 1 or 2

Z denotes a radical of formula:



in which:

the symbols R', which are identical or different, denote a C_1–C_{12} monovalent saturated hydrocarbon radical, a C_2–C_{12} monovalent alkoxyalkyl radical, or a C_6–C_{12} aryl, alkylaryl or aralkyl radical;

X denotes a hydrogen atom or a methyl radical;

W denotes a covalent bond or a C_1–C_4 linear or branched alkylene radical;

the symbols R, which are identical or different, denote a C_1–C_{20} alkyl, vinyl, phenyl, 3,3,3-trifluoropropyl or hydroxyl radical, provided that only one radical R per silicon atom may be a hydroxyl group; and mixtures thereof.

5,063,053

ISOLATION AND PURIFICATION OF THE R18 ANTIGEN OF HTLV-III

Flossie Wong-Staal, Rockville, Md.; Pranab K. Chanda, Paoli, and John Ghrayeb, Thorndale, both of Pa., assignors to The United States of America as represented by the Department of Health & Human Services, Washington, D.C.

Division of Ser. No. 920,780, Oct. 20, 1986, Pat. No. 4,963,497.
This application Jul. 25, 1990, Ser. No. 556,999
Int. Cl.[5] A61K *39/21, 39/42;* **C07K** *15/06*
U.S. Cl. 424—89 **3 Claims**

1. An isolated, more than 95% pure R18 antigen encoded by the R gene of HTLV-IIIB virus as shown in FIG. 1A.

5,063,054

MICROBIAL PRODUCTS USED FOR TREATMENT OF HEPATITIS

Joseph Chang, 6-21-3 Sieji, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 182,943, Apr. 18, 1988, abandoned.
This application Apr. 19, 1990, Ser. No. 512,053
Int. Cl.[5] A61K *35/74*
U.S. Cl. 424—92 **5 Claims**

1. A method of treating human hepatitis which comprises administering to a human in need thereof a therapeutically effective amount of an agent which comprises a water soluble, ethanol insoluble extract derived from cells of *Achromobacter stenohalis.*

5,063,055

PREPARATION OF STRAINS OF *BACILLUS THURINGIENSIS* HAVING AN IMPROVED ACTIVITY AGAINST CERTAIN LEPIDOPTEROUS PESTS AND NOVEL STRAIN PRODUCED THEREBY

Denis H. Burges, Goring-by-Sea, and Paul Jarrett, Littlehampton, both of England, assignors to Agricultural Genetics Company, Limited, Cambridge, England

Division of Ser. No. 784,562, Oct. 4, 1985, Pat. No. 4,935,353.
This application Mar. 27, 1990, Ser. No. 500,199
Claims priority, application United Kingdom, Oct. 9, 1984, 8425487
Int. Cl.[5] C12N *1/20, 15/03;* **A01N** *63/00*
U.S. Cl. 424—93 **4 Claims**

1. An entomocidal composition comprising a strain of *Bacillus thuringiensis* having all the identifying characteristics of strain GC91, (NCTC 11821) or a derivative or mutant thereof having entomocidal activity against lepidopterous pests, or a spore-crystal complex produced by said strain, derivative or mutant, together with a carrier, diluent, surfactant or application-promoting adjuvant.

5,063,056

MELANOGENESIS-INHIBITING PREPARATION FOR EXTERNAL APPLICATION

Shinji Yamamoto, Fukuoka, Japan, assignor to Sansho Seiyaku Co., Ltd., Fukuoka, Japan

Filed May 21, 1990, Ser. No. 526,354
Claims priority, application Japan, Jun. 12, 1989, 1-149833
Int. Cl.[5] A61K *7/00, 7/48*
U.S. Cl. 424—401 **3 Claims**

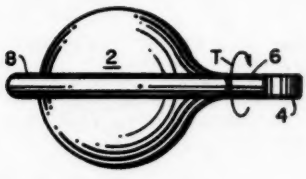
1. A preparation for external application to skin to inhibit melanine formation comprising 5-hydroxy-2-methoxymethyl-γ-pyrone as an active ingredient, said active ingredient being present in an amount ranging from 0.001 to 20% by weight of the total amount of said preparation, said preparation being in a form selected from the group consisting of lotions, emulsions, ointments, cataplasms and creams to be applied to human skin.

5,063,057

COSMETIC CAPSULES

Joseph X. Spellman, Westport, Conn.; Marlene C. Beck, and Victoria Connell, both of New York, N.Y., assignors to Elizabeth Arden Co., Division of Conopco, Inc., New York, N.Y.

Filed Sep. 26, 1990, Ser. No. 588,249
Int. Cl.[5] A61K *7/00*
U.S. Cl. 424—401 **12 Claims**



1. A cosmetic product comprising:

a cosmetic composition pharmaceutically acceptable for application to a human body; and

a capsule completely enclosing said cosmetic composition, said capsule comprising:

(i) a round body defined by an outward wall and having a hollow chamber, said round body forming a major portion of said capsule, said round body including a ring

projecting outwardly from and circumferentially encompassing said outer wall, said ring being positioned in a plane equatorially cutting said round body, said cosmetic composition being contained within said chamber;

(ii) a tab forming a minor portion of said capsule; and

(iii) a neck section connecting said tab with said round body, said neck section upon being twisted breaking to allow exit of said composition from said chamber.

5,063,058

METHOD OF ATTRACTING *TRIBOLIUM CONFUSUM J.* USING 2,6-DIMETHYL-1-OCTANOL

Tatsuji Chuman, Yokohama, and Mikio Ono, Hamura, both of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 512,424

Claims priority, application Japan, Apr. 25, 1989, 1-105505

Int. Cl.[5] A01N *25/10, 25/08, 25/34*

U.S. Cl. 424—405 **7 Claims**

1. A method of attracting *Tribolium confusum J.* to a predetermined trapping location, which comprises placing an effective amount of 2,6-dimethyl-1-octanol at a predetermined trapping location, wherein said 2,6-dimethyl-1-octanol is supported by a solid carrier; wherein said solid carrier is in the form of a disc or a tablet; wherein said solid carrier is impregnated with said 2,6-dimethyl-1-octanol in an amount of 1/10 to 1/100,000 the weight of said solid carrier; and wherein said solid carrier is selected from the group consisting of pulp, polysulfone nylon, nylon, polycarbonate, polyvinylidene chloride, polyvinyl chloride, polyvinylidene fluoride, polyurethane, cellulose ester, polyvinyl alcohol, epoxy resin and polyolefin, thereby luring *Tribolium confusum J.* to the trapping location.

5,063,059

MICROENCAPSULATED COCKROACH-CONTROLLING COMPOSITION

Toshiro Ohtsubo, Hyogo; Shigenori Tsuda, Kyoto; Hitoshi Kawada; Goro Shinjo, both of Osaka, and Kozo Tsuji, Nara, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 290,384, Dec. 27, 1988, abandoned. This application Nov. 15, 1990, Ser. No. 614,555

Claims priority, application Japan, Dec. 25, 1987, 62-331237

Int. Cl.[5] A01N *25/34*

U.S. Cl. 424—408 **1 Claim**

1. A microencapsulated cockroach controlling composition comprising:

phenylxylylethane and (RS)-α-cyano-3-phenoxybenzyl (1R)-trans-chrysanthemate encapsulated in microencapsules, said microcapsules having

(a) a polyurethane wall,

(b) an average particle diameter of 16 to 80 microns,

(c) a wall thickness of 0.06 to 0.3 microns, and

(d) an average particle diameter size to wall thickness ratio of 100 to 400.

5,063,060

COMPOSITIONS AND METHOD FOR TREATING PAINFUL, INFLAMMATORY OR ALLERGIC DISORDERS

Joel E. Bernstein, Deerfield, Ill., assignor to Cisco Limited Partnership, Lincolnshire, Ill.

Filed Dec. 19, 1989, Ser. No. 452,476

Int. Cl.[5] A61K *9/02, 9/20, 1/48, 31/16*

U.S. Cl. 424—422 **14 Claims**

1. A composition comprising cis-8-methyl-N-vanillyl-6nonenamide in an amount of about 0.001% to about 1.0% by weight and a pharmaceutically acceptable vehicle, said composition for use in the treatment of painful or allergic disorders, said composition being comparable in efficacy to compositions containing capsaicin but with significantly less local adverse effects normally associated with capsaicin.

5,063,061

AQUEOUS PREPARATION OF PYRIDO(1,2-A)PYRIMIDINE COMPOUND

Takashi Yazaki, Misato; Tomohisa Matsushita, Okegawa, and Tsutomu Nagase, Ohizumimachi, all of Japan, assignors to Tokyo Tanabe Company, Tokyo, Japan

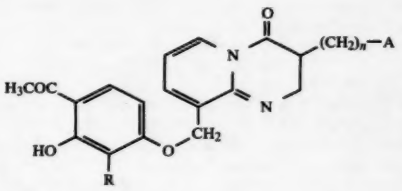
Filed Mar. 27, 1990, Ser. No. 499,954

Claims priority, application Japan, Jun. 9, 1989, 1-145201

Int. Cl.[5] A61F *2/00, 13/00;* A61K *31/52*

U.S. Cl. 424—427 **7 Claims**

1. An aqueous preparation comprising of 0.1 to 0.3% (W/V) of a pyrido[1,2-a]pyrimidine compound represented by the following formula:



wherein R represents an n-propyl or allyl group, A represents a tetrazolyl or carboxyl group, and n represents an integer of 0 to 2;

0.5 to 2.0% (W/V) of a polyoxyethylene sorbitan fatty acid ester, 0.5 to 2.0% (W/V) of polyethylene glycol and 1.0 to 3.5% (W/V) of disodium hydrogenphosphate.

5,063,062

CLEANING COMPOSITIONS WITH ORANGE OIL

Douglas H. Greenspan, Louisville, and Phillip A. Low, Littleton, both of Colo., assignors to D. Greenspan and W. Ingram, both of Louisville, Calif.

Filed Sep. 27, 1989, Ser. No. 413,395

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—443 **12 Claims**

1. A skin cleaning composition adapted for external use on human tissues, comprising a first ingredient being between five percent (5%) and sixty percent (60%) by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent in the form of an oat grain derivative product.

5,063,063

HYPOADHERENT DRESSINGS COMPRISING LIQUID PERVIOUS POLYMER COATING OF POLYURETHANE CONTAINING SILOXANE RESIDUES

Nigel D. Miller, South Wirral, United Kingdom, assignor to Smith & Nephew plc, United Kingdom

Filed May 17, 1989, Ser. No. 352,872

Claims priority, application United Kingdom, May 18, 1988, 8811776

Int. Cl.[5] A61L *15/00;* B32B *27/12, 27/28, 27/40*

U.S. Cl. 424—445 **12 Claims**

1. A hypoadherent dressing comprising a fibrous body-facing substrate having a liquid pervious polymer coating on its body-contacting surface, wherein said polymer coating comprises a polyurethane containing siloxane residues.

5,063,064

METHOD FOR INHIBITING OR DESTROYING SPERMATOZOA

Pierre Bourbon, Toulouse, France; Pierre Lagny, Kildare, Ireland, and Pierre Billot, Neuilly/Seine, France, assignors to Atlantic Pharmaceutical Products Ltd., Celbridge, Ireland

Filed Sep. 20, 1988, Ser. No. 246,982
Int. Cl.[5] A61K *33/14*
U.S. Cl. 424—673 9 Claims

1. A method for inhibiting or destroying spermatozoa which comprises contacting the spermatozoa with a spermicidally effective amount of a composition which comprises ionic or ionizable lithium.

5,063,065

COMPOSITION AND METHOD FOR THE TREATMENT OF GENITAL DYSPLASIA

Enrique J. V. Bazterrica, and Enrique T. V. Bazterrica, both of 266 Roque Saenz Pena St., 1st Fl. "E" (1642), San Isidro, Province of Buenos Aires, Argentina

Filed Oct. 9, 1990, Ser. No. 594,838
Int. Cl.[5] A61K *33/34*
U.S. Cl. 424—637 3 Claims

1. A method for the diagnosis of genital dysplasia associated with viral condylomatosis, comprising applying an effective amount of a composition comprising a saturated solution of copper sulfate in a pharmacological acceptable medium to an area where genital dysplasia is suspected and observing the area for staining.

5,063,066

DIETARY MODIFICTION TO ALLEVIATE TOXICITY IN LIVESTOCK CAUSED BY MYCOTOXINS

Sid D. Hulse, Marietta, Ga.; D. V. Maurice, Clemson, S.C.; Nelson E. Ward, Blairstown, and David L. Wicker, Ringwood, both of N.J., assignors to Degussa Corporation, Ridgefield Park, N.J.

Filed Jan. 29, 1990, Ser. No. 472,046
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—2 8 Claims

1. A method for alleviating adverse toxicity reactions in poultry induced by feeding mycotoxin contaminated feed comprising feeding said conventional poultry with a feed diet an and amount of methionine and niacinamide effective to alleviate said adverse toxicity reactions to mycotoxins in poultry.

5,063,067

CONCENTRATED LIQUID FEED SUPPLEMENT CONTAINING POSITIONALLY STABILIZED EAT AND METHOD

Stephen F. Binder, Washington, Mo., and Kent J. Lanter, Millstadt, Ill., assignors to Purina Mills, Inc., St. Louis, Mo.

Continuation of Ser. No. 93,473, Sep. 4, 1987, abandoned. This application May 15, 1990, Ser. No. 523,841
Int. Cl.[5] A23K *1/22*
U.S. Cl. 426—69 22 Claims

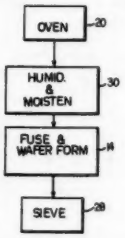
1. A stable liquid feed concentrate which upon dilution with water becomes a liquid feed composition for animals, the concentrate consisting essentially of an aqueous phase containing nutrients, a dispersion in said aqueous phase of fat in an amount normally separating as an oil phase added in order to confer an increased energy level to the feed concentrate and, as a dispersing agent stabilizing the fat against separation from the aqueous phase, the sodium hydroxide saponification product of a portion of the fatty acids contained in the added fat, included in the concentration in an amount effective to form a stable dispersion without further processing.

5,063,068

METHOD OF PRODUCING LAMINATED WAFERS

Paul A. Cavanagh, Scituate, R.I., assignor to Cavanagh Company, Greenville, R.I.

Filed Jun. 7, 1990, Ser. No. 534,503
Int. Cl.[5] A21D *13/00*; A23G *3/00*
U.S. Cl. 426—94 11 Claims



1. A method for producing laminated bread wafers comprising,

first producing at least two sheets of bread by baking a batter comprising flour and water, each sheet having opposing friable outer crusts enclosing a center which is soft and porous relative to the crusts, and then

fusing at least part of one outer crust of a first one of the sheets of bread to at least part of one outer crust of a second one of the sheets of bread by the following steps:

(a) moistening at least one outer crust of the first sheet and at least one outer crust of the second sheet, by applying an aqueous-composition sufficient to render them fusable, and

(b) thereafter, fusing at least part of the two fusable outer crusts,

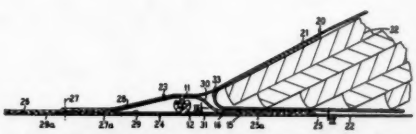
the method being characterized by advancing the sheets between wafer-forming members in an operation that forms the wafers and seals the outer crust edges to conceal lamination.

5,063,069

ZIPPERED CLOSURE FOR THERMOFORMED PACKAGE

Donald L. Van Erden, Wildwood; Daniel P. McDonald, Arlington Heights, both of Ill., and Steven Ausnit, New York, N.Y., assignors to Zip-Pak Incorporated, Northbrook, Ill.

Continuation-in-part of Ser. No. 327,619, Mar. 23, 1989. This application Apr. 27, 1990, Ser. No. 515,628
Int. Cl.[5] B65D *33/16*
U.S. Cl. 426—122 17 Claims



1. A plastic bag for foodstuffs or the like, comprising in combination:

a first plastic film bag wall joined at its edge to a second plastic film bag wall with a bag mouth at a top of the bag between the walls at a top of the bag;

reclosable fastener strips between the walls at the bag mouth having facing releasably interlocking profiles thereon each with a base web bonded to the confronting surfaces of the film, each base web having an inner portion extending downwardly toward the bag interior and an outer portion extending outwardly above the profiles;

the inner portion of said base webs being joined to each other to seal the bag interior;

frangible tear means on the inner portion of one of said base webs for breaking into the bag interior so that the profiles can be separated and thereafter afford a reclosable bag mouth; and the inner portion of one of said base webs being bonded to the film and the inner portion of the other base web forming a barrier membrane and being substantially free of the attachment to the film.

5,063,070

PROCESSES FOR SEPARATION OF STEROL COMPOUNDS FROM FLUID MIXTURES USING SUBSTANTIALLY INSOLUBLE COMPOUNDS

Lawrence P. Klemann, Somerville, and John W. Finley, Whippany, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1989, Ser. No. 373,822

Int. Cl.[5] A23C *9/14*; C12H *1/04*

U.S. Cl. 426—271 **37 Claims**

1. A process for separation of at least one sterol compound from a fluid mixture, said process comprising:

(a) treating a substantially insoluble carbonate salt with a first sterol compound capable of become adsorbed on the surface of the substantially insoluble carbonate salt, said treatment being effected under conditions effective to cause the first sterol compound to become reversibly adsorbed on the surface of the substantially insoluble carbonate salt, thereby producing a sterol-modified carbonate;

(b) treating the sterol-modified carbonate produced in step (a) with an excess of a surface-modifying agent, the surface-modifying agent having a reactive group capable of reacting with the surface of the substantially insoluble carbonate salt, and an elongate hydrophobic portion, the treatment of the sterol-modified carbonate with the surface-modifying agent being effected under conditions such that the adsorbed first sterol compound is not desorbed from the substantially insoluble carbonate salt but substantially all of the reactive sites on the surface of the substantially insoluble carbonate salt not covered by the adsorbed sterol compound react with the surface-modifying agent;

(c) desorbing the first sterol compound from the substantially insoluble carbonate salt, thereby producing a surface-modified carbonate; and

(d) contacting the surface-modified carbonate from step (c) with the fluid mixture under conditions effective to permit adsorption of at least one second sterol compound on to the surface-modified carbonate, and separating the surface-modified carbonate from the fluid mixture thereby producing a fluid mixture having a reduced content of the at least one second sterol compound.

5,063,071

METHOD FOR CENTERING AN EGG YOLK DURING COOKING

Gerd Bergmeier, Hiddenhausen, Fed. Rep. of Germany, assignor to Erich Bergmeier Maschinenfabrik, Fed. Rep. of Germany

Filed Aug. 22, 1990, Ser. No. 570,773

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928346

Int. Cl.[5] A47J *29/00*

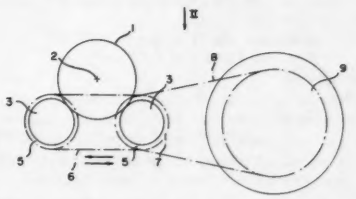
U.S. Cl. 426—298 **5 Claims**

1. A method for centering an egg yolk during cooking, comprising the steps of

(a) cooking the egg;

(b) rotating the egg in a first direction about its longitudinal axis for a first interval of time during said cooking step;

(c) rotating the egg in a second direction about its longitudinal axis opposite said first direction for a second interval of time during said cooking step; and



(d) repeating steps (b) and (c) until the egg white has solidified.

5,063,072

ONE-STEP FLAVORED PASTA PRODUCTS AND PROCESSES FOR PREPARING FAST COOKING PASTA PRODUCTS

Stephen R. Gillmore, Cato; Carleton G. Merritt, Phoenix; Dhyaneshwar B. Chawan, and Edward A. Matuszak, both of Liverpool, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 225,211, Jul. 28, 1988, abandoned, and Ser. No. 149,589, Jan. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 105,704, Oct. 8, 1987, abandoned. This application Feb. 28, 1990, Ser. No. 485,893

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—557 **77 Claims**

1. A process for fast cooking pasta comprising the steps of

(a) soaking uncooked pasta in water having a temperature of between about 33° F. (0.6° C.) and about 140° F. (60° C.) for a period of time sufficient to hydrate said pasta; and

(b) cooking the soaked pasta resulting from step (a) by heating it for a period of time shorter than said be needed to cook pasta which had not been previously soaked,

said uncooked pasta being one which displays a starch loss of less than about 7.0 weight percent when evaluated by cooking 170 grams in 350 grams of water in a microwave oven at 700 watts for eight minutes and then extracting with 500 ml of room temperature water.

5,063,073

C-GEL COMPOSITE FOOD PRODUCTS

John F. Kratochvil, Oak Brook, Ill., assignor to Kraft General Foods, Inc., Glenview, Ill.

Division of Ser. No. 307,069, Feb. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 658,618, Oct. 9, 1984, Pat. No. 4,684,533, and a continuation-in-part of Ser. No. 81,115, Aug. 3, 1987, abandoned. This application Aug. 7, 1990, Ser. No. 563,499

Int. Cl.[5] A23L *1/05, 1/052*

U.S. Cl. 426—573 **12 Claims**

1. A method for manufacturing a packaged C-Gel composite food comprising steps of mixing and heating to at least pasteurization temperature components comprising at least about 30 weight percent water, at least about 1 weight percent gelatin, at least about 0.5 weight percent kappa carrageenan, and a dispersed food product selected from the group consisting of meat, seafood, fruit, vegetable, synthetic protein fibers, chocolate or mixtures thereof, to provide a fluid, heated packaging blend;

introducing the fluid, heated packaging blend into a packaging material tube to provide a C-Gel blend filled packaging tube; and

cross sealing and severing the C-Gel filled packaging material tube to provide a plurality of individually wrapped C-Gel food products.

5,063,074

LOW FAT LOW CHOLESTEROL MILK PRODUCTS

Marvin L. Kahn, Williamsville, and John S. O'Mahony, Clarence Center, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Filed Jan. 30, 1990, Ser. No. 472,018

Int. Cl.[5] A23C *9/15, 9/154*

U.S. Cl. 426—585 11 Claims

1. A low fat, low cholesterol milk product approximating the taste and mouthfeel of whole or 2% milk comprising about 95 to about 99% skim milk and about 1 to about 5% of a premix, wherein said premix comprises about 50 to about 70% non-tropical vegetable oil, about 15 to about 20% food grade gum, about 6 to about 10% of a flavoring agent and about 6 to about 10% non-lauric emulsifier, said emulsifier comprising about 35 to about 54% mono and diglycerides, about 23 to about 43% sodium stearoyl lactylate and about 12 to about 32% polysorbate 60.

5,063,075

AMIDE ETHER DERIVATIVES AS LOW CALORIE FAT MIMETICS

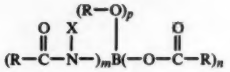
Ronald G. Yarger, Covent Station; Lawrence P. Klemann, Somerville, and John W. Finley, Whippany, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Aug. 1, 1990, Ser. No. 561,868

Int. Cl.[5] A23D *9/00*

U.S. Cl. 426—601 29 Claims

1. A fat mimetic composition of the following formula, useful as a fat replacement in edible materials:



where

B is an aliphatic group having from 2 to 12 carbons,

each R is, independently, an aliphatic group having 1 to 30 carbons,

X=H, R or (CO)—R,

m=1 to 2,

n=0 to 6, and

p=1 to 2.

5,063,076

MULTIFUNCTIONAL, FAT-CONTINUOUS EMULSIONS WITH A REDUCED FAT CONTENT

Roger M. Finlayson, Farrarmere, South Africa; Harry Scharmann, Bromley, Great Britain, and Leo F. Vermaas, Maassluis, Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Oct. 2, 1990, Ser. No. 595,649

Claims priority, application United Kingdom, Aug. 29, 1986, 8620897

Int. Cl.[5] A23D *3/00, 5/00*

U.S. Cl. 426—602 7 Claims

1. Water-in-oil emulsion comprising:

(i) a fat-containing fatty phase having from 40 to 75 wt. % of a fat containing at least 10% of crystallized fat within the temperature range of 15°–30° C.;

(ii) a thickened proteinaceous, aqueous phase constituting at least 25% by weight of the total water-in-oil emulsion and containing a thickening agent or a gelling agent selected from the group consisting of a protein, a polysaccharide and mixtures thereof; and

(iii) an emulsifier system comprising mono-esters of saturated fatty acids and mono-esters of unsaturated fatty acids, said mono-esters formed from a polyhydroxyl alcohol selected from the group consisting of glycerol, polyglycerol, and mixtures thereof, wherein

(a) the amount of unsaturated fatty acid ester ranges from 0.1–0.6 wt. %,

(b) the amount of saturated fatty acid ester ranges from 0.1–0.4 wt. %, and

(c) the ratio of saturated fatty acid ester to unsaturated fatty acid ester ranges from 0.2–1.8.

5,063,077

PROCESS FOR THE REMOVAL OF CHOLESTEROL AND CHOLESTEROL ESTERS FROM EGG YOLK

Heinz-Rüdiger Vollbrecht, Altenmarkt; Jan Cully, Trostberg, and Johann Wiesmüller, Engelsberg, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Nov. 21, 1989, Ser. No. 439,556

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928258

Int. Cl.[5] A23L *1/32, 1/015*

U.S. Cl. 426—614 8 Claims

1. The method of removing cholesterol and cholesterol esters from egg yolk composed of egg yolk plasma and an LDL-granula fraction, which comprises

a) optionally adding an emulsion-breaking agent to the egg yolk,

b) separating the egg yolk plasma from the LDL-granula fraction,

c) adsorbing the cholesterol and cholesterol esters contained in the egg yolk plasma on a solid adsorbent,

d) separating the adsorbent loaded with cholesterol and cholesterol esters from the egg yolk plasma, and

e) optionally recombining the egg yolk plasma with the LDL-granula fraction.

5,063,078

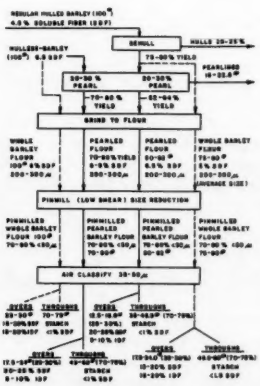
METHOD OF DRY MILLING AND PREPARING HIGH SOLUBLE FIBER BARLEY FRACTION

Karen B. Foehse, Plymouth, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Nov. 16, 1989, Ser. No. 437,229

Int. Cl.[5] B02C *7/00*

U.S. Cl. 426—618 10 Claims



1. A method for preparing a barley four fraction having a concentrated level of soluble dietary fiber, consisting essentially of the steps of:

A. milling barley having a native soluble dietary fiber content to form a course barley flour having a particle size such that about 90% is less than 600 microns and greater than 50% larger than 200 microns;

B. size reducing without shearing the coarse barley flour in a single step to form a fine barley flour having a particle

size such that 30% to 80% of the fine barley flour is less than about 50 microns;

C. classifying the fine barley flour employing a screen setting ranging from about 28 to 65 microns into a first, minor barley flour fraction of a larger particle size having a concentrated soluble dietary fiber content at least 1.2 to 5× the native concentration and a second, major barley flour fraction of a smaller particle size having a reduced soluble dietary fiber content; and

D. separately recovering the first and second barley flour fractions.

5,063,079

METHOD OF PRODUCING SHELF STABLE WHEAT GERM

Peter J. Ferrara, Ridge Rd., P.O. Box 441, Cornwall, N.Y. 12518, and John T. Benson, 1260 N. 200 East, #18, Logan, Utah 84321

Filed Dec. 6, 1989, Ser. No. 446,806

Int. Cl.[5] A21D *2/38*

U.S. Cl. 426—627 **4 Claims**

1. A method of extending the shelf life of wheat germ, by the elimination of free SH groups, without adversely affecting the flavor of the wheat germ, which comprises: contacting the wheat germ with steam in a chamber, under a combination of conditions sufficient to reduce the sulfhydryl(SH) content of the wheat germ to substantially nil, including maintaining pressures of about 8 to 14 PSIG in said chamber for about 20 to 35 minutes, while drawing off from said chamber about 0.20 lb. to 0.40 lb. of steam per lb. of wheat germ being steamed.

5,063,080

SUGAR-FREE CRUST CHOCOLATES

Christof Kruger, Hamburg, and Karl Cappelmann, Solingen-Wald, both of Fed. Rep. of Germany, assignors to Suomen Xyrofin Oy, Kotka, Finland

Filed May 18, 1990, Ser. No. 524,879

Claims priority, application Fed. Rep. of Germany, May 18, 1989, 3916189; Dec. 2, 1989, 3939997

Int. Cl.[5] A23G *1/00*

U.S. Cl. 426—660 **16 Claims**

1. A composition for preparing a sugar-free crust for candies consisting essentially of:

(a) a polyol at 42–71% by weight;

(b) water or a mixture of water and alcohol at 28 to 48% by weight; and

(c) a thickening agent for retarding gelatinization or crystallization at 1–10% by weight;

wherein the ratio of said polyol to said water is 2.5:1 to 1.5:1.

5,063,081

METHOD OF MANUFACTURING A PLURALITY OF UNIFORM MICROFABRICATED SENSING DEVICES HAVING AN IMMOBILIZED LIGAND RECEPTOR

Stephen N. Cozzette, Hightstown; Graham Davis, Plainsboro; Jeanne Itak, Hamilton, all of N.J.; Imants R. Lauks, Yardley, Pa.; Randall M. Mier, Ottawa, Canada; Sylvia Piznik, Jackson, N.J.; Nicolaas Smit, Hightstown, N.J.; Susan Steiner, Trenton, N.J.; Paul Van Der Werf, Princeton Junction, N.J., and Henry J. Wieck, Brooklyn, N.Y., assignors to I-Stat Corporation, Princeton, N.J.

Division of Ser. No. 432,714, Nov. 7, 1989, which is a continuation-in-part of Ser. No. 381,223, Jul. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 270,171, Nov. 14, 1988, abandoned. This application Aug. 15, 1990, Ser. No. 567,870

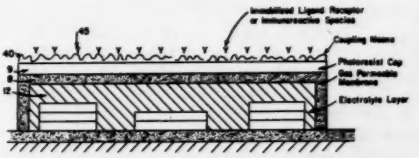
Int. Cl.[5] G01N *33/53*

U.S. Cl. 427—2 **31 Claims**

1. A method of manufacturing a plurality of uniform microfabricated sensing devices which comprises:

(a) establishing a plurality of base sensors on a suitable substrate wafer;

(b) establishing a permselective layer, superimposed over at least a portion of each base sensor, having a thickness sufficient to exclude substantially molecules with a molecular weight of about 120 or more while allowing the free permeation of molecules with a molecular weight of about 50 or less;



(c) establishing a photoresist layer comprising a photoformable proteinaceous mixture, superimposed over a substantial portion of said permselective layer; and

(d) establishing a topmost layer comprising a sufficient amount of an immobilized ligand receptor.

5,063,082

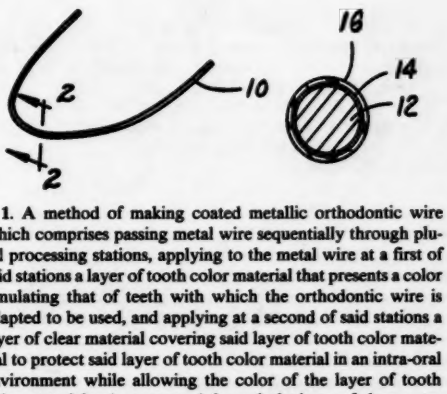
METHOD OF MAKING COATED METALLIC ORTHODONTIC ARCH WIRE

Loren S. Adell, 6207 Telluride La., Dallas, Tex. 75252, assignor to Loren Adell and Michael Adell, both of Sunnyvale, Tex.

Division of Ser. No. 202,785, Jun. 3, 1988, Pat. No. 4,946,387. This application Jul. 27, 1990, Ser. No. 558,709

Int. Cl.[5] A61C *7/20*

U.S. Cl. 427—2 **11 Claims**



1. A method of making coated metallic orthodontic wire which comprises passing metal wire sequentially through plural processing stations, applying to the metal wire at a first of said stations a layer of tooth color material that presents a color simulating that of teeth with which the orthodontic wire is adapted to be used, and applying at a second of said stations a layer of clear material covering said layer of tooth color material to protect said layer of tooth color material in an intra-oral environment while allowing the color of the layer of tooth color material to be presented through the layer of clear material.

5,063,083

PHOTOLYTIC DEPOSITION OF METAL FROM SOLUTION ONTO A SUBSTRATE

John J. Eisch, Vestal, N.Y., and Marek P. Boleslawski, Binghamton, N.Y., assignors to The Research Foundation of the State University of New York, Albany, N.Y.

Filed Jun. 5, 1990, Ser. No. 533,317

Int. Cl.[5] B05D *3/06, 5/12*; C01B *00/00*

U.S. Cl. 427—53.1 **8 Claims**

1. A process for the substantially photolytic deposition of a metal from solution onto a substrate which comprises irradiation with light to cause said deposition, of a solution formed by combining as separate reagents, (1) metal source selected from the group consisting of a 1,3-dicarbonyl complex of the metal and a soluble inorganic metal salt, and (2) a tetraarylborate

compound capable of coordination with the metal species so as to be capable of promoting the photoreduction of the metal onto the substrate when the solution is in contact with the substrate.

5,063,084

METHOD OF PREVENTING ADHERENCE OF INSECT RESIDUES TO VEHICULAR SURFACES

Riley H. Nelson, 131 E. Hwy. 50, Winter Garden, Fla. 32787

Filed May 31, 1990, Ser. No. 531,054

Int. Cl.[5] B05D *5/08*

U.S. Cl. 427—154 8 Claims

1. A process for preventing insect remains from adhering to and damaging surfaces of a vehicle after impacting therewith, and for making such insect remains easily removable, comprising the steps of:

A. mixing together the following ingredients:

(1) one hundred gallons of water;

(2) from one to thirty gallons of a hydrophilic agent;

(3) from one to nineteen gallons of an emulsifier;

(4) from one pint to two quarts of vegetable oil;

(5) from one to twenty-three gallons of chlorine and phosphorus-free surfactant/detergent;

(6) from one pint to five gallons of non-ionic surfactant/detergent;

(7) from 0.0005 lbs. to 0.0015 lbs. of non-toxic, non-corrosive stabilizer;

(8) from 0.005 to 0.015 lbs. of anti-oxidant/color stabilizer;

B. applying a coating of said mixture of ingredients to selected surfaces of a vehicle for which protection is desired;

C. removing insect remains from the surfaces of the vehicle by removing the coating with water.

5,063,085

COATING METHOD

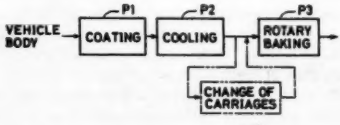
Takakazu Yamane; Yoshio Tanimoto, and Tadamitsu Nakahama, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 1, 1990, Ser. No. 560,994

Claims priority, application Japan, Aug. 1, 1989, 1-201074

Int. Cl.[5] B05D *1/102, 3/00*

U.S. Cl. 427—240 23 Claims



1. A coating method comprising a coating step for spraying a substrate with a paint and a drying step for drying the paint sprayed on the substrate;

wherein the coating step is to spray a surface of the substrate extending substantially upwardly and downwardly with the paint to form a coat in a thickness thicker than a thickness ar which the paint starts sagging;

the drying step is to dry the coat formed on the substrate by rotating the substrate about its axis extending in a substantially horizontal and longitudinal direction of the substrate for a period of time ranging from the time when the paint coated starts sagging on the surface of the substrate extending substantially upwardly and downwardly to the time when the paint of the coated formed thereon achieves a substantially sagless state, the rotation of the substrate sprayed with the paint thereon being carried out at a speed which is high enough to rotate the substrate from a vertical position to a horizontal position before the paint coated thereon substantially sags due to gravity yet which is low enough so as to cause no sagging as a result of centrifugal force; and

a cooling step for cooling with cool air the coat formed by spraying the substrate with the paint is provided immediately after the coating step yet before the drying step.

5,063,086

VACUUM DEPOSITION PROCESS AND APPARATUS FOR PRODUCING FILMS HAVING HIGH UNIFORMITY

Douglas B. Meakin, Harrow-on-the-Hill, England, assignor to The General Electric Company p.l.c., England

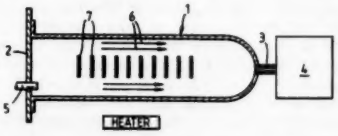
PCT No. PCT/GB88/01126, § 371 Date Sep. 5, 1989, § 102(e) Date Sep. 5, 1989, PCT Pub. No. WO89/05872, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 16, 1988, Ser. No. 399,474

Claims priority, application United Kingdom, Dec. 18, 1987, 8729548

Int. Cl.[5] C23C *16/40, 16/44, 16/46, 16/52*

U.S. Cl. 427—255.3 5 Claims



1. A low-pressure chemical vapor deposition process for depositing a substantially uniform film on at least one major surface of a substrate, the process comprising the steps of:

(a) feeding at least one reactant film-forming gas into a deposition chamber along a gas flow direction;

(b) mounting the substrate within the chamber, and orienting said at least one major surface to be substantially perpendicular to the gas flow direction;

(c) heating said at least one reactant gas at said at least one major surface to cause a reaction of said at least one reactant gas, thereby forming the film on said at least one major surface; and

(d) maintaining pressure within the chamber at a level below 10 mTorr during the heating step, and maintaining a value of Sherwood number indicative of the uniformity of the film much smaller than unity, whereby the film formed on said at least one major surface is substantially uniform.

5,063,087

PROCESS FOR STRENGTHENING THE ADHESION OF POLYMERIC SUBSTANCES TO CARBONATE SURFACES

Herbert Eck, Burghausen; Gerald Fleischmann, Emmerting; Höhl Horst, Munich, and Helmut Weber, Ebersberg, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1990, Ser. No. 501,109

Claims priority, application Fed. Rep. of Germany, May 5, 1989, 3914874

Int. Cl.[5] B05D *3/10*

U.S. Cl. 427—302 28 Claims

1. A process for strengthening the adhesion of a polymeric substance which contains organic groups or are made up of such groups, or a substance containing organic groups which can be crosslinked to form a polymer, to a surface containing an inorganic carbonate, which comprises applying, a solution containing an organic aprotic solvent and a phsophorus compound to a surface containing an inorganic carbonate, in which the phosphorus compound is selected from the group consisting of phosphorus acid and a phosphorus-containing organosilicon compound having at least one group of the formula

RSiOP=O,

in which R is an SiC-bonded radical selected from the group consisting of a monovalent unsubstituted hydrocarbon radical and a monovalent substituted hydrocarbon radical, removing the solvent and thereafter applying the polymeric substance to the treated surface containing the inorganic carbonate, said phosphorus-containing organosilicon compound is selected from the group consisting of (1)

$$(RR^1{}_2SiO)_3P{=}O,$$

in which R is the same as above, R^1 is a radical selected from the group consisting of an SiC-bonded monovalent unsubstituted hydrocarbon radical, a monovalent substituted hydrocarbon radical, an alkoxy radical, an alkoxyalkylenoxy radical having from 1 to 4 carbon atoms per radical, radicals of the formula

$$R_3SiO_{\frac{1}{2}},$$

in which R is the same as above, radicals having from 2 to 10 siloxane units of the formula

$$RSiO_{3/2},\ R_2SiO \text{ or } SiO_{4/2},$$

in which R is the same as above and mixtures of at least 2 such siloxane units and (2) a compound obtained from the reaction of a silane of the formula

$$RSi(OR^2)_3,$$

in which R is the same as above, R^2 is selected from the group consisting of an alkyl radical having up to 4 carbon atoms per radical, an alkoxyalkylene radical having up to 4 carbon atoms per radical and partial hydrolyzates thereof containing at most 15 silicon atoms per molecule, with a phosphorus compound selected from the group consisting of orthophosphoric acid, phosphorus acid, phosphorus pentoxide and mixtures thereof, in which the reaction product contains from 0.005 to 0.33 phosphorus atom per silicon atom in the organosilicon compound.

5,063,088

PROCESS FOR PRODUCING REINFORCED POLYMER COMPOSITIONS

Seetha Coleman-Kammula, and Johannes C. M. Gillemans, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 14, 1989, Ser. No. 393,159

Claims priority, application United Kingdom, Nov. 25, 1988, 8827400

Int. Cl.[5] B05D *3/00, 3/04*

U.S. Cl. 427—352 **11 Claims**

1. A process of producing a polymer composition comprising (1) a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and (2) a fibrous inorganic reinforcing material, comprising the steps of:

(a) uniformly coating the fibrous inorganic material with a solution of the linear alternating polymer, said solution having a viscosity of from about 0.5 Pa.s to about 10 Pa.s.; and

(b) subsequently removing the solvent of said solution with a selective solvent which will dissolve the solvent of the linear alternating polymer solution but is a non-solvent for the linear alternating polymer.

5,063,089

HYDROXYLAMINE OR AMINE OXIDE CONTAINING POLYPHENOLIC COMPOUNDS AND USES THEREOF

Andreas Lindert, Troy; John R. Pierce, Huntington Woods, and David R. McCormick, Madison Heights, all of Mich., assignors to Henkel Corporation, Ambler, Pa.

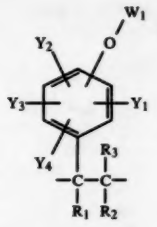
Continuation of Ser. No. 128,756, Dec. 4, 1987, Pat. No. 4,970,264. This application Sep. 26, 1990, Ser. No. 588,232

The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.

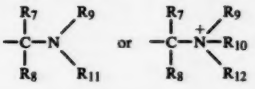
Int. Cl.[5] B05D *3/00*

U.S. Cl. 427—354 **18 Claims**

1. A homo- or co-polymer or a salt thereof, wherein at least 1 percent of the repeating units in the homo- or co-polymer conform to the general formula:



in which R_1 through R_3 are independently selected for each repeating unit from hydrogen, an alkyl group having from 1 to about 5 carbon atoms, or an aryl group having from about 6 to about 18 carbon atoms; Y_1 through Y_3 are independently selected for each repeating unit from hydrogen, Z, $—CR_4$, R_5OR_6, $—CH_2Cl$, or an alkyl or aryl group having from 1 to 18 carbon atoms; Y_4 is Z; and Z conforms to the general formula:



in which R_4 through R_{10} are independently selected for each repeating unit from hydrogen, an alkyl, aryl, hydroxy-alkyl, amino-alkyl, mercapto-alkyl, phospho-alkyl moiety, $—O^{(-1)}$ or —OH; R_{11} is —OH; and R_{12} is $—O^{(-1)}$; W_1 is independently selected for each repeating unit from the group consisting of hydrogen; acyl; 3-allyloxy-2-hydroxypropyl; 3-benzyloxy-2-hydroxypropyl; 3-alkylbenzyloxy-2-hydroxypropyl; 3-phenoxy-2-hydroxypropyl; 3-alkylphenoxy-2-hydroxypropyl; 2-hydroxyalkyl; 2-hydroxy-2-phenyl ethyl; 2-hydroxy-2-alkylphenyl ethyl; isopropenyl-; propenyl; benzyl; alkyl; allyl; alkylbenzyl; haloalkyl; haloalkenyl; sodium, potassium; tetra aryl ammonium; tetra alkyl ammonium; tetra aryl phosphonium; tetra alkyl phosphonium; and a condensation product of ethylene oxide, propylene oxide, or a mixture or copolymer thereof.

5,063,090

LECITHIN AS A WETTABILITY ENHANCING COATING FOR PLASTIC

Jon C. Wannlund, San Diego, Calif., assignor to Difco Laboratories, Detroit, Mich.

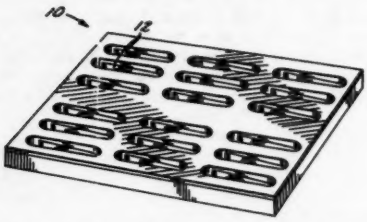
Filed Jun. 29, 1990, Ser. No. 548,233

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—384 **19 Claims**

10. A process for preparing a reaction test apparatus treated for enhanced wettability, comprising the steps of:

furnishing an untreated plastic reaction test apparatus having a preselected form;



applying to the surface of the piece of reaction test apparatus a solution of lecithin in a solvent; and

evaporating the solvent.

5,063,091

METHOD FOR USE OF AQUEOUS ELASTOMERIC COATINGS

Richard Martorano, Marlton, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 6, 1989, Ser. No. 418,293
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—385.5 12 Claims

1. A method for use of an aqueous elastomeric coating comprising:

(a) forming an ambient-temperature-drying coating composition comprising at least two mutually incompatible water-insoluble polymers prepared by the polymerization of ethylenically unsaturated monomers, wherein at least one of said polymers comprises N-methylol functionality; and

(b) applying said composition to a surface;

(c) drying said coating composition at a temperature lower than about 50° C.

12. The method of claim 1 or claim 7 wherein said substrate surface is a sports surface.

5,063,092

USE OF PERFLUOROPOLYETHERS IN THE FORM OF AN AQUEOUS MICROEMULSION FOR PROTECTING STONY MATERIALS FROM ATMOSPHERIC AGENTS

Daria Lenti, and Mario Visca, both of Alessandria, Italy, assignors to Ausimont S.r.l., Italy

Continuation of Ser. No. 334,522, Apr. 7, 1989, abandoned. This application Apr. 25, 1990, Ser. No. 512,907
Claims priority, application Italy, Apr. 8, 1988, 20126 A/88
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—393 6 Claims

2. A process for protecting marble, stone, tiles, cement, gypsum or wood and other similar materials utilized in the building industry from the deterioration caused by atmospheric agents and pollutants, comprising applying onto said materials a protective agent selected from the products having perfluoropolyether structure composed of sequences of fluorooxyalkylene units selected from the class consisting of:

$$(CF(CF_3)CF_2O);\ (CF_2CF_2O);\ (CF_2O);\ (CF(CF_3)O);\ (CF_2C(CF_3)_2O);$$

$$(CF_2CF_2CF_2O);\ \text{and}\ (CF_2CF_2CH_2O);$$

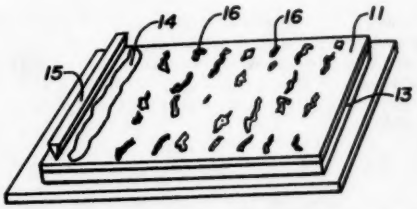
having perfluoroalkyl end groups and furthermore being characterized in that the perfluoropolyether product is applied in the form of an aqueous microemulsion.

5,063,093

SIMULATED MARBLE AND PROCESS OF PREPARATION

Nancy E. Mentzer, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 5, 1989, Ser. No. 402,352
Int. Cl.[5] B44E 9/04
U.S. Cl. 428—15 3 Claims



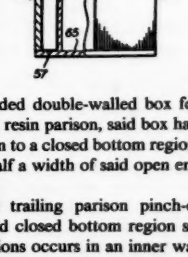
1. A shaped solid simulated travertine marble article having surface indentations of irregular shape and depth wherein said solid material is phosphate bonded material and said indentations are produced by the generation of at least carbon dioxide from the chemical reaction of magnesium or calcium carbonate with phosphoric acid during formation of said phosphate bonded material.

5,063,094

DRAPED PARISON BLOW MOLDED BOX

Richard C. Legge, Pittsford, and George F. Arp, Fairport, both of N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.

Division of Ser. No. 335,576, Apr. 10, 1989, Pat. No. 4,948,357, which is a division of Ser. No. 868,294, May 28, 1986, Pat. No. 4,828,786. This application Jul. 3, 1990, Ser. No. 547,283
Int. Cl.[5] B65D 1/40
U.S. Cl. 428—35.7 6 Claims



1. A blow molded double-walled box formed of a single, partially inverted, resin parison, said box having a depth from an open end region to a closed bottom region, said depth being larger than one-half a width of said open end region, and said box comprising:

a. leading and trailing parison pinch-off regions being formed in said closed bottom region so that one of said pinch-off regions occurs in an inner wall of said box and the other of said pinch-off regions occurs in an outer wall of said box; and

b. said open end region of said box being formed from an inverted portion of said parison spanning a space between said inner and outer walls of said box.

5,063,095

EXPANDABLE POWDER COATING COMPOSITION, METHOD OF COATING A SUBSTRATE WITH HEAT-INSULATING FOAM AND COMPOSITE MATERIAL OBTAINED THEREBY

Katsuji Kitagawa, Kasukabe; Kazutomo Moriguchi, Soka; Tetsuo Miyake, Saitama; Katusya Sano, Chiryu; Kiyoshi Kittaka, Okazaki, and Tetsuya Sakakibara, Gamagouri, all of Japan, assignors to Somar Corporation and Nippondenso Co., Ltd., both of, Japan

Filed Sep. 5, 1990, Ser. No. 577,663
Claims priority, application Japan, Sep. 6, 1989, 1-232024
Int. Cl.[5] C08J *9/10*
U.S. Cl. 428—35.8 14 Claims

1. An expandable, powder coating composition having a particle size distribution wherein the content of particles with a particle size of 40 mesh or finer is 100% by weight, the content of particles with a particle size of 200 mesh or finer is at least 50% by weight and the content of particles with a particle size of 325 mesh or finer is not greater than 50% by weight and comprising:

(a) a thermoplastic resin containing a copolymer of ethylene with vinyl acetate;

(b) a cross-linking agent containing an organic peroxide which is capable of reacting with said copolymer at a temperature higher than the melting point of said thermoplastic resin to crosslink said copolymer and which is solid at room temperature;

(c) a blowing agent capable of decomposing and generating a gas when heated to a temperature higher than the melting point of said thermoplastic resin; and

(d) an organic plasticizer.

5,063,096

OPTICAL DISK

Teiji Kohara, Kawasaki; Masayoshi Oshima, Niiza, and Tadao Natsuume, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1990, Ser. No. 534,215
Claims priority, application Japan, Jun. 10, 1989, 1-147299
Int. Cl.[5] B32B *3/02*
U.S. Cl. 421—64 11 Claims

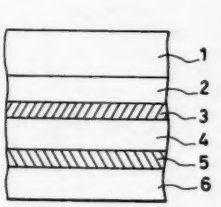
1. An optical disk having an optical reflectivity of 70% or above which comprises a substrate made of a thermoplastic saturated norbornene polymer having a glass transition temperature of 100° C. or above and a light reflecting layer formed by laminating, on said substrate, a multi-layer film constituted of at least one compound selected from the group consisting of metallic oxides and metallic fluorides.

5,063,097

OPTICAL RECORDING MEDIUM

Kusato Hirota, Otsu; Gentaro Ohbayashi, Kusatsu, and Toshiharu Nakanishi, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,782
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—65 10 Claims



1. An optical recording medium comprising a substrate and at least each of a recording layer and a protective layer, said recording layer being formed on said substrate for recording information thereon or reading or erasing information on record thereon by light-irradiation on the recording layer, wherein the recording and erasing of information takes place through a phase transition between an amorphous phase and a crystalline phase in said recording layer, said recording layer comprising a solid solution of a palladium, antimony and tellurium alloy with germanium, telluride, and having a composition represented by the following formula:

$$(M_xSb_yTe_{1-x-y})_{1-z}(Te_{0.5}Ge_{0.5})_z$$

wherein M is palladium; each of X, Y and Z represents the atomic fraction of respective elements; and $0.01 \leqq X \leqq 0.1$, $0.35 \leqq Y \leqq 0.65$ and $0.2 \leqq Z \leqq 0.4$.

5,063,098

VIBRATION DAMPING MATERIALS AND SOUNDPROOFING STRUCTURES USING SUCH DAMPING MATERIALS

Takahiro Niwa, Nara, and Yasuo Shimizu, Chiba, both of Japan, assignors to Nichias Corporation, Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,611
Claims priority, application Japan, Apr. 1, 1988, 63-80382; Jul. 13, 1988, 63-172619
Int. Cl.[5] B32B *1/04, 15/08*
U.S. Cl. 428—76 18 Claims

1. A soundproofing structure comprising in combination: a noise generating portion, a sound absorbing material surrounding said noise generating portion, and a vibration damping material which forms a cladding panel of said sound absorbing material; wherein said vibration damping material includes first and second materials, each being formed of a metal sheet having a rubber- or synthetic resin-base viscoelastic polymeric layer formed on one side, and includes a hot-melt-adhesive synthetic resin layer having a high melting point, which serves to bond together said first and second materials, while they are arranged in opposition to each other through said viscoelastic polymeric layers, and wherein said metal sheets, said polymeric layers and said resin layer all extend substantially parallel to each other.

5,063,099

NON-WOVEN MAT CONSISTING OF ACRYLIC CONTINUOUS FILAMENTS SHOWING HIGH MODULUS IMPREGNATED WITH AN INORGANIC MATRIX

Raffaele Tedesco; Giampaolo Busato, and Giampaolo Sinatora, all of Mestre, Italy, assignors to Montefibre S.p.A., Milan, Italy

Continuation of Ser. No. 196,342, Oct. 9, 1987, abandoned. This application Mar. 19, 1990, Ser. No. 496,116
Claims priority, application Italy, Oct. 14, 1986, 21990 A/86
Int. Cl.[5] B32B *5/12, 13/00*
U.S. Cl. 428—109 9 Claims

1. A non-woven mat impregnated with an inorganic matrix, said mat consisting of at least one layer, wherein each layer consists of a plurality of continuous parallel, monodirectional polyacrylic filaments having a tenacity of at least 50 cN/tex, an elastic modulus of at least 1,000 cN/tex, and an ultimate elongation lower than 15%, the filaments in each layer being bound together, said continuous filaments being arranged in a spread out open structure obtained by opening a tow of filaments until

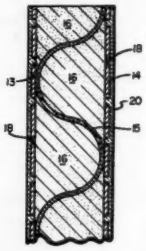
a width of between 50 and 500 cm prior to bonding the filaments in each layer to the other, wherein the filaments are bonded together by a cohesion agent in an amount from 5 to 50% by weight of the filaments, and the cohesion agent is a member of the group of agents which dissolve or swell in water or an alkaline solution of the matrix, employed when the non-woven mat is impregnated with the inorganic matrix to manufacture reinforced inorganic matrix.

5,063,100

MOISTURE-IMPERVIOUS PANEL CAPABLE OF DELAYED, RAPID HYDRATION INCLUDING WATER CHANNELS FILLED WITH WATER-REMOVAL MATERIAL

William Alexander, Naperville, Ill., assignor to American Colloid, Arlington Heights, Ill.

Filed Feb. 15, 1990, Ser. No. 481,442
Int. Cl.[5] B32B *3/10*; F02D *19/00*
U.S. Cl. 428—137 **10 Claims**



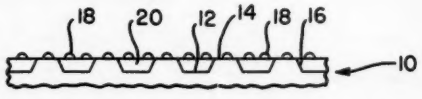
1. A rigid panel useful as a water barrier including first and second facing sheets having a layer of water, swellable clay therebetween, one of said facing sheets being water-permeable and including a plurality of water channels therein extending from an outer surface of the one facing sheet to an inner surface of the one facing sheet said water channels containing a layer of material completely across the water channel having a predetermined water-solubility to prevent water from passing through the water channels during installation of the panel and removable by water contact after panel installation.

5,063,101

INTERLINING

Peter S. Grynaeus, Lowell; Anthony Hollingsworth, Pepperel, and Chester J. Petkiewicz, Lowell, all of Mass., assignors to Freudenberg Nonwovens Limited Partnership, Lowell, Mass.

Filed Dec. 23, 1988, Ser. No. 289,611
Int. Cl.[5] A41D *27/00, 27/06*; B32B *3/10, 7/14*
U.S. Cl. 428—172 **43 Claims**



1. A shirt interlining comprising:

a base material having a contoured or textured surface and bonded thereon an intermediate layer comprising a fleece of fibers, said fleece of fibers or a porous film, said intermediate layer having an upper surface on which there is disposed a plurality of heat activatable adhesive means, said adhesive means being substantially in a single planar arrangement and at least some of which are separated from said base material by the intermediate layer.

5,063,102

RADIATION CURABLE ORGANOSILOXANE GEL COMPOSITIONS

Chi-Long Lee; Michael A. Lutz, and Bernard VanWert, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 1, 1989, Ser. No. 444,351
Int. Cl.[5] B32B *9/06, 15/04*; C08G *77/00*
U.S. Cl. 428—209 **6 Claims**

1. An organosiloxane gel composition that cures upon exposure to ultraviolet radiation, said composition comprising

(1) a polyorganosiloxane consisting essentially of 80 to 97 mole percent of $(CH_3)_2SiO$ units, 2 to 10 mol percent of $CH_3SiO_{1.5}$ units, 1 to 6 mol percent of $(CH_3)_3SiO_{0.5}$ units and 0.2 to 4 mol percent of units represented by the formula $(CH_3)_aR^1SiO_{(3-a)/2}$, where R^1 represents 3-cyclohexenyl, cyclohexenylethyl or $CH_2{=}CH(CH_2)_x$, a is 1 or 2, and X represents 0 or an integer from 1 to 6, inclusive;

(2) as the curing agent for said composition, a liquid organic compound containing an average of at least two mercapto groups per molecule or a liquid mercaptoalkyl substituted polydiorganosiloxane containing an average of at least two repeating units per molecule corresponding to the formula

$$-\overset{R^2}{\underset{R^3}{\overset{|}{\underset{|}{SiO}}}}- \text{ or } R^2-\overset{R^3}{\underset{R^3}{\overset{|}{\underset{|}{SiO}}}}-$$

where R^2 represents a mercaptoalkyl radical, R^3 represents a monovalent hydrocarbon or halohydrocarbon radical, and said curing agent is compatible with the other ingredients of said composition: and

3) a photointiator in an amount sufficient to promote curing of said composition in the presence of ultraviolet radiation.

where the molar ratio of mercapto groups to alkenyl radicals in said composition is 1 or less.

5,063,103

REINFORCED POLYMERIC MATRIX

Tomoo Sugawara, Kawasaki, and Motoyuki Yamato, Naka, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1989, Ser. No. 367,580
Claims priority, application Japan, Jun. 21, 1988, 63-151118
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—285 **20 Claims**

1. A reinforced polymer comprising a ring-opened nonbornene polymer and a glass fiber mat disposed therein, wherein said norbornene polymer comprises at least one norbornene-type monomer which is polymerized in the presence of said glass mat, and wherein aid mat contains a hydrocarbon binder selected from the group consisting of polyolefins, vinyl aromatic polymers, and mixtures thereof.

5,063,104

FIBROUS BASE WEB BONDING SYSTEM AND METHOD

Diane M. Robertson, West Suffield, and Ludmila Byalik, West Hartford, both of Conn., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed Jan. 3, 1990, Ser. No. 460,405
Int. Cl.[5] A22C *11/00*; B32B *33/00, 27/04*; B65D *8/34*
U.S. Cl. 428—286 **20 Claims**

1. A bonded porous fibrous sheet material for use in the manufacture of food casings and the like comprising a fibrous base web containing about 10% by weight and less of a bonding system comprising a first treatment of a thermoplastic film forming material effective for imparting high alkaline strength

to the base web and a subsequent treatment of a film forming material and an insolubilizing agent for the film forming material, said subsequent treatment being effective to impart high wet strength and absorption to the first treated web without substantially reducing the alkaline strength thereof.

5,063,105

MAGNETIC RECORDING MEDIUM IN WHICH CERTAIN PHYSICAL PROPERTIES OF THE MAGNETIC LAYER AND THE BACKCOAT LAYER ARE SPECIFIED

Katsumi Ryoke; Masatoshi Takahashi, and Yasuo Nishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 17, 1990, Ser. No. 466,547

Claims priority, application Japan, Jan. 17, 1989, 1-005902; Mar. 6, 1989, 1-53450

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—336 **8 Claims**

4. A magnetic recording medium comprising a non-magnetic support having formed thereon a magnetic layer containing a ferromagnetic fine powder, a binder, and carbon black and formed on the opposite side to the non-magnetic support to the magnetic layer-carrying side a backing layer containing a binder and carbon black, wherein the binder of the backing layer comprises (1) a vinyl chloride resin and/or vinyl chloride-vinyl acetate copolymer resin, (2) a polyurethane resin and (3) polyisocyanate in a ratio by weight percent of 45 to 55:15 to 25:20 to 35, and wherein the gloss of the magnetic layer is at least 150, and the gloss of the backing layer is from 2 to 7, and wherein the surface free energy of the magnetic layer is from 40 to 55 dyn/cm and the surface electric resistance of the magnetic layer is not higher than 5×10^{10} Ω/cm^2, and wherein the surface free energy of the backing layer is from 45 to 60 dyn/cm and at least 1 dyn/cm higher than the surface free energy of the magnetic layer, and the surface electric resistance of the backing layer is not higher than 1×10^{5} Ω/cm^2.

5,063,106

THERMOPLASTIC PLASTICIZER-RESISTANT FILM AND PRESSURE-SENSITIVE ADHESIVE FILM COMPRISING THE PLASTICIZER-RESISTANT FILM

O. V. Nieuwenhuize, Leiden; F. de Grunt, Zoetermeer; S. de Vissser, Boskoop, and R. Vos, Alphen a/d Rijn, all of Netherlands, assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Feb. 21, 1989, Ser. No. 313,170

Claims priority, application Netherlands, Feb. 19, 1988, 8800428

Int. Cl.[5] B32B *27/32, 7/12*

U.S. Cl. 428—343 **12 Claims**

1. A plasticizer-resistant film comprised of a layer formed of a blend of polyvinyl chloride and chlorinated polyethylene in respective weight rations of 10:90 to 65:35 in which the polyvinyl chloride has a K-value of 45 to 80 and the chloride content of the chlorinated polyethylene is from 30 to 40% by weight, said film being receptive to retaining diffused plasticizer from a plasticized substrate without becoming sticky and in contact with said layer, a plasticizer-resistant, pressure-sensitive adhesive which retains adhesion in the presence of a plasticizer, said adhesive comprising a polymer containing an alkyl acrylate or alkyl methacrylate or mixtures thereof.

5,063,107

SILICON CARBIDE FIBRE AND PRODUCTION THEREOF

James D. Birchall, Mouldsworth, and William J. Clegg, Upton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 6, 1989, Ser. No. 418,262

Claims priority, application United Kingdom, Oct. 6, 1988, 8823472

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—367 **9 Claims**

1. A silicon carbide fibre in which the silicon carbide constitutes greater than 90% by weight of the fibre and in which the fibre is substantially homogeneous across a transverse section of the fibre.

5,063,108

CONTINUOUS MULTI-FILAMENT POLYESTER SUBSTRATE READILY ADHERABLE TO A VINYL SHEET

James H. Whetstone, Greensboro, N.C., assignor to Unifi, Inc., Greensboro, N.C.

Division of Ser. No. 262,538, Oct. 25, 1988, Pat. No. 4,935,293. This application Jun. 6, 1990, Ser. No. 534,184

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—369 **4 Claims**

1. Polymeric yarn intended for use in a gauze substrate to be imbedded in the surface of a vinyl sheet material comprising:

a) a textured continuous multi-filament the term polyester yarn having a plasticizer incorporated into the interfilamentary structure thereof;

b) said plasticizer being selected from the group consisting of diacid esters of fatty diacides and short chain monoalcohols, diesters of fatty acids and short chain diol alcohols, and ethoxylated alkyl aryl alcohols;

c) said plasticizer, when said polyester yarn is placed adjacent the surface of said vinyl sheeting under heat and pressure, having the characteristics of softening at least the surface of the vinyl sheeting and laminating the polyester thereto, whereby the yarn will resist pull tests of at least 3.5 lbs.

5,063,109

COVALENT ATTACHMENT OF ANTIBODIES AND ANTIGENS TO SOLID PHASES USING EXTENDED LENGTH HETEROBIFUNCTIONAL COUPLING AGENTS

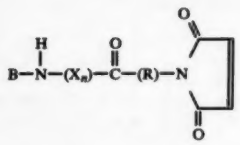
Christopher Bieniarz, Highland Park; J. Christopher Welch, Urbana; Grady Barnes, Lindenhurst, and Carol A. Schlesinger, Wheeling, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 254,288, Oct. 11, 1988, Pat. No. 5,002,883, which is a continuation-in-part of Ser. No. 114,930, Oct. 30, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 402,013

Int. Cl.[5] G01N *33/551;* D02G *3/44;* C07K *17/06*

U.S. Cl. 428—378 **5 Claims**

1. A chemically derivatized solid phases material comprising



wherein B is an amine bearing solid phase material; X is an amino acid having from three to ten carbon atoms in a straight chain; n is from one to ten; and R is an alkyl, cycloalkyl, an alkyl-cycloalkyl or an aromatic carbocyclic ring.

5,063,110

COMPOSITION COMPRISING PREPOLYMER POWDER AND PULVERULENT INORGANIC MATERIAL

Jean-Claude A. Bailly, Martigues, and Joelle Collomb, Marseille, both of France, assignors to BP Chemicals Limited, London, England

Division of Ser. No. 197,828, May 12, 1988, Pat. No. 4,970,279. This application Jul. 2, 1990, Ser. No. 547,683

Claims priority, application France, Oct. 2, 1986, 86 13854

Int. Cl.[5] C08F *4/02*; C08L *23/04*

U.S. Cl. 428—402 **2 Claims**

1. A solid composition containing catalytically active sites for a gas phase (co) polymerisation of alpha-olefins and optionally dienes, characterised in that it comprises:

(a) 100 parts by weight of a powder of a prepolymer of one or more alpha-olefins and optionally dienes, the said powder consisting of particles having a mean diameter by mass of from 50 to 500 microns, and containing per gram from 10^{-3} to 10^{-1} milligram atoms of a transition metal belonging to Groups IV, V or VI of the Periodic Table of Elements and from 0 to 20 millimols of at least one organometallic compound of a metal belonging to Groups I to III of the Periodic Table of Elements per milligram atom of the said transition metal, and

(b) from 0.1 to 20 parts by weight of a pulverulent inorganic substance consisting of particles chemically inert to the constituents used in the said gas phase (co-)polymerisation and being free from transition metal compound, said particles having a mean diameter by mass from 10 to 200 times lower than the mean diameter by mass of the particles of the said powder of prepolymer.

5,063,111

DEGRADABLE BOTTLE AND CAN CARRIER COATED WITH ULTRAVIOLET ABSORBER

Louis M. DiBello, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Feb. 5, 1990, Ser. No. 474,883

Int. Cl.[5] B65D *71/00*; B32B *27/00*

U.S. Cl. 428—411.1 **4 Claims**

1. A degradable carrier comprising:

a body,

said body being made of a degradable polymeric composition comprising a polymer and a degradable additive such that the carrier is degradable upon exposure to ultraviolet radiation,

said body having an exposed surface,

a water soluble coating containing an ultraviolet absorber applied in a layer to said exposed surface of the carrier to define a water soluble coating covering said exposed surface such that the coating protects the carrier from degrading under ultraviolet radiation until such time that the carrier is discarded and becomes wet by rainfall, water or snow, whereupon the coating washes away so that the carrier will thereafter be readily degraded by sunlight or fluorescent lighting.

5,063,112

IMPACT-RESISTANT METHACRYLATE PROTECTIVE LAYER FOR POLYCARBONATE, CONTAINING UV ABSORBER

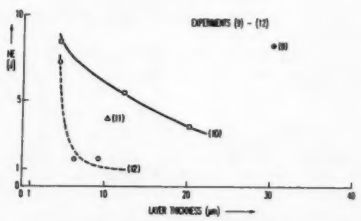
Heinz Gross, Mühltahl; Jens-Dieter Fischer, Darmstadt; Werner Siol, Darmstadt-Eberstadt; Thomas Süfke, Rossdorf, and Thomas Rhein, Stadecken-Elsheim, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Nov. 6, 1989, Ser. No. 432,388

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1988, 3837588

Int. Cl.[5] B32B *27/36, 27/08*; C08L *69/00*

U.S. Cl. 428—412 **4 Claims**



1. A multi-layer plastic element, comprising (1) a core layer of more than 50% by weight aromatic polycarbonate and (2) a thermoplastic polymethacrylate plastic layer with an impact strength which has been modified, which is in contact with said core layer, wherein said polymethacrylate plastic layer is a two-phase mixed polymer, which contains a UV absorber or UV-absorbing groups in an amount of 0.01 to 50% by weight, and said two-phase mixed polymer consists of:

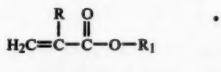
(A) 10 to 90% by weight of polymer, P, with a glass temperature $Tg \geqq 10°$ C., wherein said polymer P is selected from the group consisting of polyolefins, polydienes, ethylene/-vinyl acetate copolymers, polyacrylates, and polysiloxanes or a mixture thereof and into which 0 to 30% by weight, based on P, of polymerizable UV absorber is incorporated; and

(B) 90 to 10% by weight of a methyl methacrylate copolymer which is at least partially covalently linked with (A), with a glass temperature $Tg \geqq 30°$ C., comprising:

(i) 99.9 to 5% by weight of methyl methacrylate units and 0 to 40% by weight of other α,β-unsaturated monomer units;

(ii) 0 to 50% by weight of a polymerizable UV absorber; and

(iii) 0.1 to 95% by weight of acrylate and/or methacrylate units having formula (I)



(i)

wherein R is H or CH_3, and

R_1 is Y or A-Y, wherein Y is a substituted or unsubstituted C_{5-12} cycloalkyl or unsubstituted alkyl-substituted, or oxyalkyl-substituted C_{6-12} aryl, and A is a straight chain or branched C_{1-6} alkylene group, or a C_{2-4} oxyalkylene group, and where said copolymer (B) has a molecular weight $M_w \geqq 30{,}000$ and said aromatic polycarbonate and said copolymer (B) are compatible at all ratios, and a mixture of said polycarbonate and said copolymer (B) has a lower critical solution temperature of $\geqq 120°$ C.; and

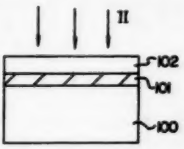
wherein the amount of UV absorber or UV-absorbing groups in phase (A) and (B) is in an amount of 0.01 to 50% by weight.

5,063,113

SUBSTRATE HAVING SEMICONDUCTOR-ON-INSULATOR STRUCTURE WITH GETTERING SITES AND PRODUCTION METHOD THEREOF

Kunihiko Wada, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 21, 1989, Ser. No. 382,937
Claims priority, application Japan, Jul. 28, 1988, 63-186872
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—446 **7 Claims**



1. A substrate having a semiconductor-on-insulator structure comprising:
a base substrate;
an insulator layer provided on said base substrate;
an active substrate provided on said insulator layer, said active substrate made of a single crystal semiconductor having gettering sites therein; and
an active layer provided on said active substrate, said active layer made of a single crystal semiconductor substantially free of gettering sites.

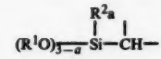
5,063,114

COATED MATERIAL

Toshiro Nambu, Hyogo; Hirotoshi Kawaguchi, Hyogo; Hisao Furukawa, Hyogo, and Yasushi Kato, Hyogo, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 6, 1990, Ser. No. 505,393
Claims priority, application Japan, Apr. 6, 1989, 1-87734
Int. Cl.[5] B32B *9/04*
U.S. Cl. 428—447 **18 Claims**

1. A coated material obtained by applying a coat containing a metallic power or a coloring pigment or both to a substrate and further applying a topcoat clear coating thereon, wherein said topcoat clear coating is a siloxy or siloxane crosslinking thermocurable coating which comprises
(A) a hydroxyl group-containing acrylic resin;
(B) an alkoxysilyl group-containing copolymer represented by formula:



where R^1 represents C_{1-10} alkyl group; R^2 represents a monovalent hydrocarbon group selected from the group consisting of hydrogen atom, alkyl group, aryl group, and aralkyl group; and a represents 0 or integer of 1 or 2; and
(C) curing catalyst.

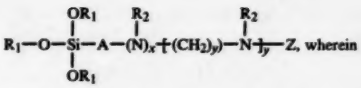
5,063,115

ELECTRONIC DEVICE COATED WITH A POLYIMIDE COATING COMPOSITION

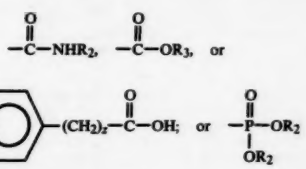
Burt T. Merriman, Jr., Willingboro, N.J., and David L. Goff, Hockessin, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 88,142, Aug. 21, 1987, abandoned. This application Jun. 15, 1990, Ser. No. 538,591
Int. Cl.[5] B32B *9/04*
U.S. Cl. 428—447 **2 Claims**

1. An electronic component comprising an inorganic substrate having an electronic device mounting thereon which is coated by a polymeric film formed by applying thereto a coating of a composition comprising an homogeneous liquid solution of:
(a) polyimide, polyamic acid or polyamide ester;
(b) silane compound corresponding to the structural formula:



R_1 is independently selected from C_{1-3} alkyl groups;
A is either phenylene or $(CH_2)w$ in which w is an integer of from 1 to 6:
R_2 is independently selected from —H and C_{1-3} alkyl groups;
Z is independently selected from —H, C_{1-8} alkyl, C_{7-12} alkaryl, C_{7-12} aralkyl, glycidyl, romantic carboxyl,



in which R_3 is phenyl or C_{1-8} alkyl;
x is zero or 1;
y is zero or an integer of from 1 to 3; and
z is zero or an integer of from 1 to 3; the sum of the carbon atoms in moieties R_2 and Z being at least 3; and
(c) aprotic solvent, the weight ratio of (b) to (a) being from 0.01 to 02
and heating the applied coating to remove solvent therefrom.

5,063,116

WIRE FOR DOT PRINTER

Norimasa Uchida, Yonago, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 619,431
Claims priority, application Japan, Mar. 16, 1990, 2-066131
Int. Cl.[5] C22C *38/22, 38/24, 38/36;* B41J *2/25*
U.S. Cl. 428—606 **7 Claims**

1. A wire for a dot printer, consisting, by weight, of 1.5 to 2.8% C, 7.5 to 12.0% Cr, at least one kind selected from the group consisting of not more than 18.0% W and not more than 11.0% Mo which W and Mo meet the relationship of $12 \leqq W + 2Mo \leqq 22$, 3 to 10% V, 1.0 to 10% Co, not more than 1.0% Si, not more than 1.0% Mn, the balance Fe and incidental impurities, the difference between the content of C and the value of carbon equivalent which difference is defined by C−Ceq is in the range of −0.5 to −0.15 where Ceq=0.06×% Cr+0.033×% W +0.063×% Mo+0.2×% V.

5,063,117

COPPER FIN MATERIAL FOR HEAT-EXCHANGER AND METHOD OF PRODUCING THE SAME

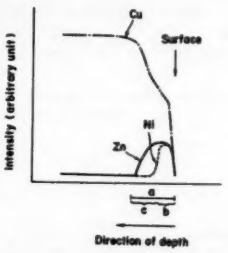
Hideo Suda, Imaichi; Norimasa Sato, Utsunomiya; Katsuhiko Takada, Anjo; Sumio Susa, Anjo; Yasushi Aiyoshizawa, Nikko, and Kenichi Omata, Imaichi, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Dec. 21, 1989, Ser. No. 454,460

Claims priority, application Japan, Dec. 27, 1988, 63-327697; Jan. 30, 1989, 1-20275; Mar. 1, 1989, 1-49177; Mar. 1, 1989, 1-49178

Int. Cl.[5] B32B *15/01*

U.S. Cl. 428—610 4 Claims



1. A copper fin material for heat-exchanger comprising:

a Cu or Cu alloy strip of a base material having a couple of outer surfaces;

an inner side diffused layer provided on at least one of said outer surfaces of said base material consisting essentially of Zn alloyed to said Cu or Cu alloy of said base material; and

a surface side diffused layer provided on the surface of said inner side diffused layer opposite said base material, comprising Zn and at least one corrosion-resisting element selected from the group consisting of Ni, Al, Sn and Co alloyed to said Cu or Cu alloy of said base material.

5,063,118

ABRASIVE DENTAL STRIP

Roland Goetz, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 4, 1989, Ser. No. 389,753

Claims priority, application Switzerland, Aug. 9, 1988, 3006/88

The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.

Int. Cl.[5] C22C *32/00*

U.S. Cl. 428—614 17 Claims

1. A metal foil-like abrasive dental strip for teeth and fillings having a maximum thickness of one millimeter and having a metal matrix solidified from a melt of the metal with hard particles having skeletal crystal shapes fixed in said matrix on one side.

5,063,119

MAGNETIC RECORDING MEDIUM COMPRISING A FLUORINE CONTAINING OLIGOMER SURFACTANT IN OR ON THE MAGNETIC LAYER

Toshio Ishida; Akira Ushimaru, and Yasuo Nishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 7, 1990, Ser. No. 489,987

Claims priority, application Japan, Mar. 7, 1989, 1-54255

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—694 7 Claims

1. A magnetic recording medium comprising a nonmagnetic support having provided thereon a magnetic layer comprising a ferromagnetic particles dispersed in a binder in an amount of from 10 to 100 parts by weight of the binder to 100 parts by weight of the ferromagnetic particles, said binder comprising a polar group-containing polymer in an amount of 5% by weight or more of the binder, said polar group-containing polymer containing a polar group in an amount of 1×10^{-6} to 1×10^{-3} equivalent per gram of polymer, said magnetic layer having therein or on its surface an ester compound in an amount of 0.1 to 3 parts by weight per 100 parts by weight of the ferromagnetic particles, said magnetic layer having therein in an amount of 0.01 to 8% by weight based on the amount of the ferromagnetic particles or on its surface in an amount of 2 to 50 mg/m^2 of the magnetic recording medium a fluorine-containing oligomer surfactant which has a side chain having a poly(alkylene oxide) structure, a side chain terminated with a perfluoroalkyl group, and a side chain derived from an ester of acrylic or methacrylic acid with an aliphatic alcohol.

5,063,120

THIN FILM MAGENTIC MEDIA

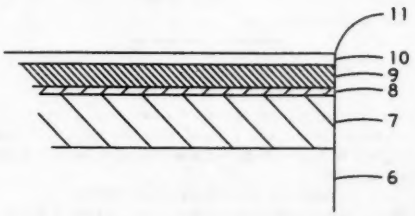
David A. Edmonson; Peter R. Ivett; Kenneth E. Johnson, all of Rochester, Minn.; Seyyed M. T. Mirzamaani, Croton-on-Hudson, N.Y., and James F. Ward, Jr., Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 160,056, Feb. 25, 1988, abandoned.

This application Mar. 27, 1990, Ser. No. 503,070

Int. Cl.[5] G11B *5/66*

U.S. Cl. 428—694 5 Claims



1. A thin film rigid magnetic recording media comprising

a rigid nonferromagnetic substrate;

a chromium underlayer of 50 to 200 angstroms thickness with the (100) plane of the body centered cubic structure parallel to the recording surface and

a ferromagnetic thin film cobalt alloy magnetic coating epitaxially grown from said chromium underlayer (100) plane with the cobalt alloy (110) plane parallel to said recording surface, whereby the cobalt alloy hexagonal close packed atomic structure has the C axis substantially parallel to said recording surface.

5,063,121

CIRCUIT SUBSTRATE COMPRISING NITRIDE TYPE CERAMICS, METHOD FOR PREPARING IT, AND METALLIZING COMPOSITION FOR USE IN IT

Hideki Sato; Nobuyuki Mizunoya, both of Yokohama; Hironori Asai, Kawasaki, all of Japan; Kazuo Anzai, Worcester, Mass., and Tsuyoshi Hatano, Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 174,902, Mar. 29, 1988, Pat. No. 4,883,704.

This application Sep. 22, 1989, Ser. No. 410,863

Claims priority, application Japan, Mar. 30, 1987, 62-73989; Mar. 31, 1987, 62-76164; Mar. 31, 1987, 62-76165; Feb. 26, 1988, 63-43858

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—698 23 Claims

1. A ceramic substrate comprising:

a substrate comprising a nitride ceramic sintered sheet;

a metallized layer formed on said substrate and comprising molybdenum, tungsten or a mixture thereof as a main

component and at least one group IVb activation metal element;

and a uniform layer of a compound comprising yttria and alumina at the interface between said nitride ceramic sintered sheet and said metallized layer and uniformly penetrating said metallized layer.

5,063,122

FUEL CELL ASSEMBLY COMPRISING PERMANENTLY COMBINED FUEL CELLS

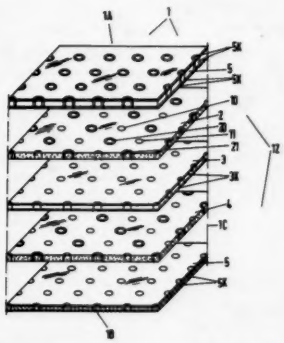
Franz-Josef Rohr, Abtsteinach, Fed. Rep. of Germany, assignor to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Apr. 24, 1990, Ser. No. 513,926

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914244

Int. Cl.[5] H01M *8/10*

U.S. Cl. 429—32 **5 Claims**



1. Fuel cell assembly, comprising at least two permanently combined fuel cells each having an anode, a cathode and an ion-conducting solid electrolyte, and said fuel cells being combined to form a fuel cell block including at least one group of inner layers and two outer layers, said outer layers being electrically conducting, and said at least one group of inner layers including a middle layer serving as said solid electrolyte, a layer serving as said cathode between one of said outer layers and said middle layer, and a layer serving as said anode between the other of said outer layers and said middle layer, wherein said layers serving as said cathodes and said anodes are gas permeable and between 0.1 mm and 1 mm thick, wherein said layers serving as said solid electrolytes and said electrically conducting layers are 50 μm to 200 μm thick, are gas-tight and have surfaces on both sides thereof with contact layers disposed on said surfaces, said fuel cell block having channels for feeding and withdrawing air and channels for feeding and withdrawing fuel and reaction products, said channels being substantially perpendicular to said layers and completely penetrating said fuel cell block, each respective channel for feeding air being surrounded by at least four channels for withdrawing air equally spaced apart from said channel for feeding air by 1 to 5 cm, and each respective channel for feeding fuel being surrounded by at least four channels for withdrawing fuel and reaction products equally spaded apart from said channel for feeding fuel by 1 to 5 cm, said channels for feeding and withdrawing air in said layers serving as said cathode having a diameter of 0.5 to 1 mm, and said channels for feeding and withdrawing fuel in said layers serving as said anodes having a diameter of 1 to 3 mm, said channels for feeding and withdrawing air in the vicinity of said anodes, said electrically conducting layers and said solid-electrolyte being gas-tightly closed towards said layers, and said channels for feeding and withdrawing fuel in the vicinity of said cathodes, said electrically conducting layers and said solid electrolytes being gas-tightly closed towards said layers, and including ceramic gas distribution plates at end surfaces of said fuel cell block having ducts for air, waste air, fuel, waste gas and reaction products, and other channels inside said gas distribution plates connecting respective ducts to respective channels in said fuel cell block.

5,063,123

SEPARATOR FOR FUEL CELL

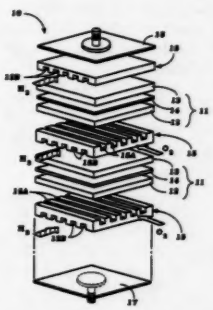
Masaru Ohsuga, and Kaoru Takahashi, both of Iwata, Japan, assignors to Yamaha Hatsudoki Katushiki Kaisha, Iwata, Japan

Filed Jan. 3, 1990, Ser. No. 460,509

Claims priority, application Japan, Jan. 6, 1989, 1-64400

Int. Cl.[5] H01M *8/04*

U.S. Cl. 429—38 **12 Claims**



1. A fuel cell for generating electrical energy from a reaction of a reformed fuel and air in said fuel cell, comprising at least one cell unit, at least one separator of one piece construction positioned on either end of said cell unit, said separator having a plurality of fuel and air passages through which fuel and air are supplied to said cell, said separator further having a plurality of pores therein containing a fluoric synthetic resin making said separator impermeable to said reformed fuel and air.

5,063,124

IONICALLY CONDUCTIVE MATERIAL

Michel Gauthier, La Prairie, Canada; Michel Armand, St. Martin D'Uriage, and Daniel Muller, Pau, both of France, assignors to Societe Nationale Elf Aquitane, Courbevoie, France and Hydro-Quebec, Montreal, Canada

Continuation of Ser. No. 114,721, Oct. 30, 1987, Pat. No. 4,851,307. This application Apr. 17, 1989, Ser. No. 338,949

Claims priority, application France, Oct. 30, 1986, 86 15113

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] H01M *6/18*

U.S. Cl. 429—192 **24 Claims**

5. In an electrochemical generator, the improvement comprising using an ionically conductive material comprising a metallic salt of a strong acid in solution in a solvent, wherein said solvent is liquid and comprises a sulfonated derivative of formula (I):

$$R_1R_2N—SO_2—NR_3R_4$$

wherein R_1, R_2, R_3 and R_4 are each independently a C_{1-10} alkyl group or a C_{1-10} oxaalkyl group.

5,063,125

ELECTRICALLY CONDUCTIVE LAYER FOR ELECTRICAL DEVICES

Huoy-Jen Yuh, Pittsford; John W. Spiewak, Webster; Constance J. Thornton, Ontario; John F. Yanus, Webster; William W. Limburg, and Joseph Mammino, both of Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1989, Ser. No. 458,937

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—59 **20 Claims**

1. An electrophotographic imaging member comprising a substrate, an electrically conductive layer comprising an organic charge transporting continuous phase and finely divided electrically conductive particles dispersed in said continuous phase, and at least one photoconductive layer.

5,063,126

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

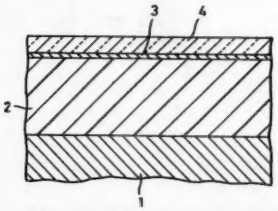
Kaname Nakatani; Yasuyuki Hanatani, and Yasufumi Mizuta, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 434,406, Nov. 13, 1989, abandoned. This application Nov. 16, 1989, Ser. No. 437,277

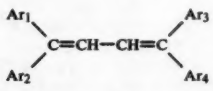
Claims priority, application Japan, Nov. 16, 1988, 63-290958; Nov. 16, 1988, 63-290960

Int. Cl.[5] G03G *5/047*

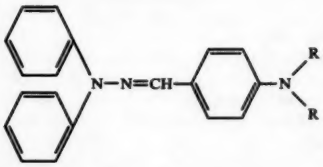
U.S. Cl. 430—59 **16 Claims**



9. A positively charged electrophotographic photosensitive material comprising a charge transporting layer and a charge generating layer which are laminated in this order on a conductive substrate, the charge transporting layer containing, as charge transporting substances, a butadiene derivative represented by the general formula (I):



wherein Ar_1 to Ar_4 are aryl groups, each of which may have substituent, and a hydrazone compound represented by the general formula (II):



wherein R is a C_1–C_4 alkyl group.

5,063,127

METHOD FOR FORMING MULTI-COLOR IMAGES

Tateki Oka, and Tomoaki Yokoyama, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1989, Ser. No. 439,581

Claims priority, application Japan, Nov. 22, 1988, 63-295379; Nov. 22, 1988, 63-295380

Int. Cl.[5] G03G *15/01*

U.S. Cl. 430—45 **17 Claims**

1. A method of forming a multi-color toner image comprising the steps of:

forming a first electrostatic latent image on an image-forming portion of an image bearer;

developing the first electrostatic latent image by using a first toner stored in a first developing unit;

forming a second electrostatic latent image on the image-forming portion;

developing the second electrostatic latent image by using a second toner stored in a second developing unit, wherein the second toner is transferrable to the image bearer under a higher bias voltage than that of the first toner, and the first toner which has been mixed into the second developing unit is chargeable to the same polarity as that of the second toner by friction with a carrier in the second developing unit;

transferring electrostatically the first and second toner images onto a recording medium; and

operating only the second developing unit for a non-image forming portion, wherein a voltage applied to the second developing unit is maintained at a higher voltage than the surface potential of the non image-forming portion so as to enable the first toner which has been mixed into the second developing unit to adhere to the non-image forming portion.

5,063,128

CONDUCTIVE AND BLOCKING LAYERS FOR ELECTROPHOTOGRAPHIC IMAGING MEMBERS

Huoy-Jen Yuh, Pittsford; John W. Spiewak, Webster; Constance J. Thornton, Ontario; Joseph Mammino, Penfield; Robert C. U. Yu, Webster; Vincent E. Hamilton, Rochester; William W. Limburg, Penfield, and Cindy Chen, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1989, Ser. No. 459,027

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—63 **18 Claims**

1. A process for preparing an electrophotographic imaging member comprising providing a substrate, applying to said substrate a coating comprising a dispersion of conductive particles having an average particle size less than about 1 micrometer and having an acidic or neutral outer surface in a basic solution comprising a film forming polymer dissolved in a solvent, drying said coating to remove said solvent and form a continuous, semi-transparent conductive layer, forming a charge blocking layer on said semi-transparent conductive layer, and forming at least one photoconductive layer on said charge blocking layer, said substrate having a transparency sufficient to transmit at least about 10 percent visible and near infrared light in the spectrum range to which said photoconductive layer is sensitive.

5,063,129

ELECTROPHOTOGRAPHIC PRINTING PLATE PRECURSOR

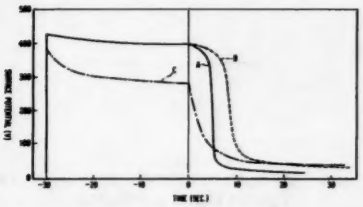
Hiroaki Yokoya; Hiromichi Tachikawa, and Syu Watarai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 13, 1989, Ser. No. 449,161

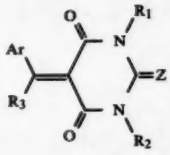
Claims priority, application Japan, Dec. 15, 1988, 63-317318; Jan. 18, 1989, 1-9501

Int. Cl.[5] G03G 15/09, 15/00, 13/28

U.S. Cl. 430—83 9 Claims

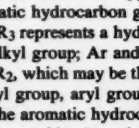


1. An electrophotographic printing plate precursor comprising an electrically-conductive support having thereon a photoconductive layer containing at least photoconductive pigments and a binder resin which is designed to undergo an electrophotographic process wherein a toner image is formed and the photoconductive layer in the nonimage portion other than the toner image portion is then removed to form a printing plate, wherein said photoconductive pigments are phthalocyanine pigments and said photoconductive layer further comprises a compound represented by the general formula (I), (II) or (III):

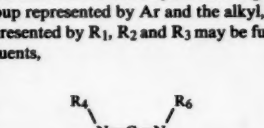


(I)

wherein Z represents a sulfur or oxygen atom; Ar represents a monovalent aromatic hydrocarbon group or monovalent heterocyclic group; R_3 represents a hydrogen atom, alkyl group, aryl group or aralkyl group; Ar and R_3 may together form a ring; and R_1 and R_2, which may be the same or different, each represents an alkyl group, aryl group or aralkyl group, with the proviso that the aromatic hydrocarbon group and heterocyclic group represented by Ar and the alkyl, aryl and aralkyl group represented by R_1, R_2 and R_3 may be further substituted by substituents,



(II)



(III)

wherein Z represents a sulfur or oxygen atom; R_4 to R_9, which may be the same or different, each represents a hydrogen atom, alkyl group, aryl group or monovalent group derived from a heterocyclic group; R_4 and R_5 or R_6 and R_7 may be connected to each other; R_4 to R_7 may be connected to each other to form a crosslinkable ring as a whole in the general formula (II); and R_{10} represents a divalent arylene, aralkylene, polymethylene or alkylene group.

5,063,130

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

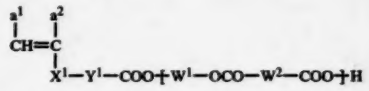
Filed Mar. 9, 1990, Ser. No. 491,018

Claims priority, application Japan, Mar. 10, 1989, 1-56379; Mar. 10, 1989, 1-58989; Apr. 7, 1989, 1-86939; Apr. 14, 1989, 1-93142

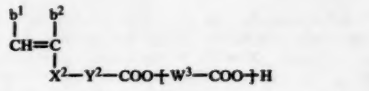
Int. Cl.[5] G03G 5/05

U.S. Cl. 439—96 9 Claims

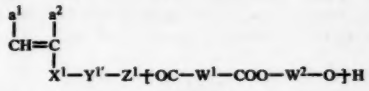
1. An electrophotographic light-sensitive material comprising an electroconductive support having formed thereon a photographic layer containing at least inorganic photoconductive particles and a binder resin, wherein the binder resin containing a copolymer having at least one of polyester type macromonomers having a weight average molecular weight of from 1×10^3 to 1.5×10^4 represented by following formulae (I), (II), (III), and (IV) as a copolymer component;



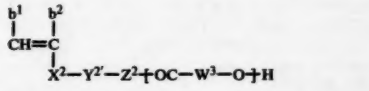
(I)



(II)

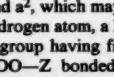


(III)

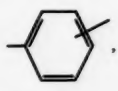


(IV)

wherein the group in the brackets represents a recurring unit; a^1 and a^2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group having from 1 to 8 carbon atoms, —COO—Z, or —COO—Z bonded through a hydrocarbon group having from 1 to 8 carbon atoms (wherein Z represents a hydrocarbon group having from 1 to 18 carbon atoms); X^1 represents a direct bond, —COO—, —OCO—, $-(CH_2)_{l1}$—COO—, $-(CH_2)_{l2}$—OCO— (wherein l^1 and l^2 each represents an integer of from 1 to 3),



(wherein P^1 represents a hydrogen atom or a hydrocarbon group having from 1 to 12 carbon atoms), —CONHCONH—, —CONHCOO—, —O—,



or $—SO_2—$; Y^1 represents group bonding X^1 to —COO—; W^1 and W^2, which may be the same or different, each represent a divalent aliphatic group, a divalent aromatic group (which

may have at least one bonding group selected from —O—, —S—,

(wherein P^2 represents a hydrogen atom or a hydrocarbon group having from 1 to 12 carbon atoms), $—SO_2—$, —COO—, —OCO—, —CONHCO—, —NHCONH—,

(wherein P^3 has the same significance as P^2),

(wherein P^4 has the same significance as P^2), and

in the bond of each divalent organic residue) or an organic residue composed of a combination of these residues; $Y^{1'}$ represent a group bonding X^1 to Z^1; $Y^{2'}$ represents a group bonding X^2 to Z^2; Z^1 represents —CH_2—, —O—, or —NH—; b^1 and b^2 have the same meaning as z^1 and a^2; and X^2 and Z^2 have the same meaning as X^1 and Z^1, respectively; and W^3 represents a divalent aliphatic group.

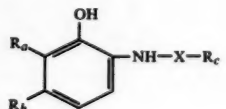
5,063,131

METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Akira Abe; Yoshihiro Fujita, and Keiji Mihayashi, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami, Japan

Continuation of Ser. No. 154,593, Feb. 10, 1988, abandoned. This application Jun. 22, 1990, Ser. No. 541,470
Claims priority, application Japan, Feb. 13, 1987, 62-31092
Int. Cl.[5] G03C *5/39, 7/40*
U.S. Cl. 430—372 **18 Claims**

1. A method for processing a silver halide color photographic photosensitive material which comprises treating a silver halide photographic photosensitive material with a bath having fixing ability and then water washing and/or stabilizing the photosensitive material, wherein the amount of replenished liquid for water washing or stabilization is 1 to 50 times the volume of liquid carried over by the photosensitive material from the bath preceding the water washing bath or the stabilization bath and that the silver halide color photographic photosensitive material comprises at least one member selected from the group consisting of compounds represented by the following general formula (A) and alkaline unstable precursors thereof:



(A)

in the general formula (A), R_a and R_b each represents hydrogen atom, halogen atom, sulfo group, carboxyl group, alkyl group, acylamino group, alkoxy group, aryloxy group, alkylthio group, arylthio group, sulfonyl group, acyl group, carbamoyl group or sulfamoyl group with the proviso that R_a and R_b may form a carbon ring together with the carbon atoms to which they are bonded; X represents —CO—; and R_c represents alkyl group, aryl group, heterocyclic group, cycloalkyl group, alkoxy group, aryloxy group or amino group; provided that the total number of carbon atoms of R_a, R_b and R_c is 10 or more and that the compound represented by the general formula (A) is substantially colorless and does not cause a coupling reaction with a developing agent to form a dye image.

5,063,132

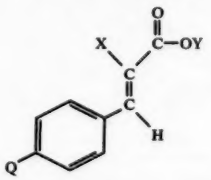
XEROGRAPHIC PHOTOTYPESETTING SYSTEM AND TONER USEFUL THEREIN

Zona R. Pierce, Rochester; Dinesh Tyagi, Fairport, and John C. Wilson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1989, Ser. No. 434,379
Int. Cl.[5] G03G *9/00, 5/00*
U.S. Cl. 430—109 **9 Claims**

1. A toner composition for imaging a photolithographic transparency comprising on a 100 weight percent basis:

(a) about 80.0 to about 99.5 weight percent of at least one polyester which contains incorporated into the polymer structure thereof about 0.1/99.9 to about 100.0/0.0 mole ratio based on the total acid or hydroxy monomers of at least one methine dye having a spectral absorption peak in the range of about 300 to about 450 nm and the formula:



wherein,

Y is a lower alkyl radical;

X is selected from the group consisting of —CN and

and

O is selected from the group consisting of $—NH_2$—NHY, $—N(Y)_2$ and

(b) about 0.5 to about 20 weight percent of at least one pigment; and

(c) about 0.05 to about 5 weight percent of at least one charge control agent, wherein the toner composition has a total transmission density of at least about 3 at a stack height of 10 microns.

5,063,133

ELECTROPHOTOGRAPHIC DEVELOPING SYSTEM COMPRISING TONER HAVING SPECIFIC PARTICLE SIZE DISTRIBUTION

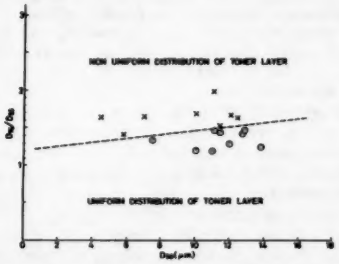
Tsutomu Kubo; Kazuo Terao; Takashi Yamamuro; Masashi Kajimoto, and Kazuhiko Tsukagoshi, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 270,448, Nov. 7, 1988, abandoned, which is a continuation of Ser. No. 925,373, Oct. 31, 1986, abandoned. This application Feb. 25, 1991, Ser. No. 659,471

Claims priority, application Japan, Oct. 31, 1985, 60-242916

Int. Cl.[5] G03G *13/09*

U.S. Cl. 430—122 **10 Claims**



1. In the method of operating an electrostatic image reproduction machine wherein particles of a mono-component developer having particle diameters of 5–20 82 m are formed into a uniform layer on a developer sleeve means by being passed between said sleeve mean sand a restriction member maintained under pressure in contact with said sleeve means and wherein an electric charge is imparted to the developer particles on said sleeve means prior to transfer thereof onto an electrostatic latent image retained on an electrostatic latent image retainer spaced opposite said developer sleeve, the improvement wherein said developer particles have a particle size distribution satisfying the following expression

$$D_{75}/d_{25} \leqq d_{50}/40+1.2$$

where d_{25}, d_{50} and d_{75} represent those particle diameters for which the integrated percentages, by weight or by volume, of particles of equal or lesser diameters constitute 25%, 50% and 75%, respectively, of the total amount of said developer particles, so that aid developer particles are enabled to consistently from a uniform thin layer on said sleeve means after being restricted by said restriction member.

5,063,134

PHOTOSENSITIVE COMPOSITION

Rumiko Horiguchi, Yokohama; Shuzi Hayase, Kawasaki, and Yasunobu Onishi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 173,546, Mar. 25, 1988, abandoned. This application Jan. 2, 1990, Ser. No. 455,783

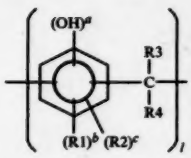
Claims priority, application Japan, Mar. 26, 1987, 62-72113; Sep. 29, 1987, 62-245497; Oct. 21, 1987, 62-263965

Int. Cl.[5] B03C *1/60*; C03F *7/08*; C08G *77/60*

U.S. Cl. 430—192 **16 Claims**

1. A photosensitive composition comprising:

a polymer having a unit represented by formula I



(I)

wherein

each of R_1 to R_4 represents a hydrogen atom, an alkyl group, an alkoxy group, a substituted or non-substituted allyl group, or these groups containing silicon, at least R_3 or R_4 being a silicon containing alkyl group having 1 to 10 carbon atoms a carbon atom of which is directly attached to the main chain of the polymer represented by formula I;

l represents a positive integer; and

each of a and b represents an integer from 1 to 3, and c represents an integer from 0 to 2, a+b+c not exceeding 4,

in admixture with a photosensitive effective amount of at least one photosensitive agent selected from the group consisting of a negative type azide compound, a positive type benzoquinone diazide compound and positive type naphthoquinone diazide compound.

5,063,135

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masaharu Toriuchi, and Hirokazu Kondo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

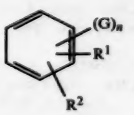
Filed Feb. 27, 1990, Ser. No. 485,907

Claims priority, application Japan, Feb. 27, 1989, 1-45723; Mar. 3, 1989, 1-51571; Mar. 30, 1989, 1-80104; Apr. 18, 1989, 1-97873

Int. Cl.[5] G03C *5/54, 1/42/1/04*

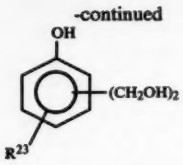
U.S. Cl. 430—214 **7 Claims**

1. A color diffusion transfer photographic light-sensitive material comprising at least a light-sensitive silver halide emulsion layer combined with a dye providing compound capable of releasing or producing a diffusible dye, an image-receiving layer capable of mordanting said diffusible dye and a neutralizing layer, said light-sensitive material further comprising at least one member selected from the group consisting of polymers obtained by the condensation of at least one of compounds represented by general formula (I) and at least one of compounds represented by general formula (III) in the presence of an acid catalyst; and polymers obtained by the condensation of at least one of compounds represented by general formula (I) and at least one of compounds represented by general formula (V) in the presence of an acid catalyst; with the proviso that said polymers obtained by condensation have an average molecular weight of from 1,000 to 24,500 when said polymers do not contain long-chain alkyl groups having 6 or more carbon atoms and said polymers have an average molecular weight of from 1,000 to 8,000 when said polymers contain long-chain alkyl groups having 6 or more carbon atoms:

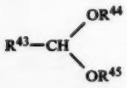


(I)

-continued



(III)



(V)

wherein G represents a hydroxyl group or a group which undergoes hydrolysis by an alkali to produce a hydroxyl group; n represents an integer 1 or more, with the proviso that the plurality of G's may be the same or different; R^1 and R^2 may be the same or different and each represents a hydrogen atom or a substituent on the benzene ring; R^{23} represents a hydrogen atom, alkyl group, aryl group, aralkyl group, heterocyclic group, acyl group, carboxyl group or formyl group; R^{43} represents a hydrogen atom, alkyl group, aryl group, aralkyl group, heterocyclic group, acyl group or carboxyl group; and R^{44} and R^{45} may be the same or different and each represents an alkyl group, with the proviso that R^{44} and R^{45} may be connected to each other to form a ring.

5,063,136

PROCESSING LIQUID FOR USE IN DTR-PHOTOGRAPHY WITH TWO TONERS

René M. De Keyzer, Sint-Niklaas; Raymond L. Odeurs, Edegem, and Luc A. De brabandere, Lier, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed May 17, 1990, Ser. No. 524,382

Claims priority, application European Pat. Off., May 18, 1989, 89201251.9

Int. Cl.[5] G03C *5/54, 5/46*

U.S. Cl. 430—248 **17 Claims**

11. A silver complex diffusion transfer reversal (DTR-) process which is carried out by development of an information-wise exposed silver halide emulsion layer with a developing agent in the presence of a silver halide solvent to form diffusible silver complexes which diffuse into an image-receiving layer containing development nuclei, and in which said information-wise exposed photographic silver halide emulsion layer is moistened with an aqueous alkaline processing liquid, wherein said liquid contains one or more alkanolamines, the said alkanolamine(s) consisting of one or more tertiary alkanolamines in a total amount in the range from 0.15 mol to 1.5 mol/l, and one or more secondary alkanolamines in an amount higher than 5 mol % but not higher than 100 mol % with respect to the amount of tertiary alkanolamine(s), and said liquid also contains a mixture of a silver image toning agent A being 1-phenyl-1H-tetrazole-5-thiol or a tautomer thereof and at least one other silver image toning agent B being a 1-phenyl-1H-tetrazole-5-thiol or a tautomer thereof, wherein the phenyl nucleus is substituted with halogen, the toning agent A and toning agent(s) B being present in said liquid in a molar ratio from 1/15 to 15/1.

5,063,137

LASER-MARKING METHOD AND RESIN COMPOSITION FOR LASER-MARKING

Toshiyuki Kiyonari, Urawa; Satoshi Hirabayashi, Ohmiya; Naoto Kidokoro, Ageo, and Futoshi Takimoto, Kawanishi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Nov. 9, 1989, Ser. No. 433,996

Int. Cl.[5] G03C *5/00;* **C08K** *3/38*

U.S. Cl. 430—292 **12 Claims**

1. A method for laser-marking which comprises marking the surface of an object composed of a resin composition containing at least one inorganic compound selected from the group consisting of an anhydrous metal borate salt, an anhydrous metal phosphate salt, a phosphoric acid-containing glass, basic zinc carbonate and basic magnesium carbonate, and a resin by applying laser beams onto the surface.

5,063,138

POSITIVE-WORKING PHOTORESIST PROCESS EMPLOYING A SELECTED MIXTURE OF ETHYL LACTATE AND ETHYL 3-ETHOXY PROPIONATE AS CASTING SOLVENT DURING PHOTORESIST COATING

Thomas E. Salamy, North Kingstown, R.I., assignor to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Division of Ser. No. 269,521, Nov. 10, 1988, Pat. No. 4,965,167. This application Jun. 4, 1990, Ser. No. 533,258

Int. Cl.[5] G03F *7/023, 7/30, 7/32*

U.S. Cl. 430—326 **10 Claims**

1. The process of developing an image-wise exposed positive-working photoresist-coated substrate comprising:

(1) coating said substrate with a light-sensitive composition useful as a photoresist, said composition comprising an admixture of:

(a) at least one alkali-soluble binder resin;

(b) at least one photoactive compound;

(c) a sufficient amount of a solvent mixture comprising ethyl lactate and ethyl 3-ethoxy propionate to dissolve (a) and (b);

wherein the amount of said binder resin is from about 60% to 95% by weight, the amount of said photoactive compound is from about 5% to about 40% by weight, both based on the total solids contents of said light-sensitive composition, and wherein the weight ratio of ethyl lactate to ethyl 3-ethoxy propionate is from 30:70 to about 80:20, and wherein said substrate is a silicon-containing wafer having a diameter of at least 6 inches;

(2) subjecting said coating on said substrate to an image-wise exposure of radiant light energy; and

(3) subjecting said image-wise exposed coated substrate to a developing solution to form a positive image-wise pattern in the coating.

5,063,139

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CAPABLE OF BEING PROCESSED AT ULTRAHIGH SPEED AND PROCESS FOR THE FORMATION OF COLOR IMAGES USING THEREOF

Hiroshi Hayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Jun. 15, 1990, Ser. No. 539,434

Claims priority, application Japan, Jun. 19, 1989, 1-156323; Jan. 10, 1990, 2-003236

Int. Cl.[5] G03C *7/30, 7/32*

U.S. Cl. 430—377 **11 Claims**

11. A process for the formation of color images comprising (i) imagewise exposing a color photographic light-sensitive material and (ii) subjecting the exposed material to development for not more than 20 seconds, said color photographic light-sensitive material comprising at least two light-sensitive layers on at least one side of a support, wherein each layer contains a light-sensitive silver halide emulsion and a nondiffusive oil-soluble coupler capable of coupling with an oxidation product of an aromatic primary amine color developing agent to produce a dye, said light-sensitive layers having different sensitive wavelength ranges, said silver halide is silver chloride or silver chlorobromide containing at least 90 mol % of silver chloride, and the alkali-consuming amount of said light-sensitive material is not more than 2.6 mmol/m^2.

5,063,140

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Satoru Kuse; Masao Ishikawa; Shigeharu Koboshi; Minoru Ishikawa, and Toshihiko Yagi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 309,818, Feb. 10, 1989, abandoned. This application Apr. 12, 1990, Ser. No. 508,786
Claims priority, application Japan, Feb. 15, 1988, 63-32501; Mar. 9, 1988, 63-55855
Int. Cl.[5] G03C 5/44
U.S. Cl. 430—393 16 Claims

1. A method for forming color photographic images comprising steps of

imagewise exposing to light a silver halide color photographic light-sensitive material,

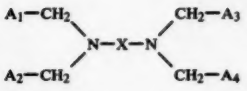
developing said light-sensitive material with a color developer,

bleaching, immediately after said step of developing, said light-sensitive material with a bleaching solution for 90 seconds or less, and

treating, after said step of bleaching, said light-sensitive material with a solution having fixing capability, wherein

said light-sensitive material comprises a support and hydrophilic colloid layers including a silver halide emulsion layer provided on a side of said support, and a total dry thickness of said hydrophilic colloid layers is not more than 17 μm, and an amount of silver in said silver halide contained in said silver halide emulsion layers included in said hydrophilic layers is from 0.5 g/m^2 to 4.7 g/m^2, and

said bleaching solution contains a ferric complex salt of a compound represented by the following Formula A in an amount of within the range of from 0.002 mole to 0.4 mole per liter of said bleaching solution;



Formula A

where A_1 through A_4 are each a $—CH_2OH$ group, a —COOM group, or a $—PO_3M^1M^2$ group, which may be the same with or different, M, M^1 and M^2 are each a hydrogen atom, a sodium atom, a potassium atom or an ammonium group; X is a substituted or unsubstituted alkylene group having three to five carbon atoms.

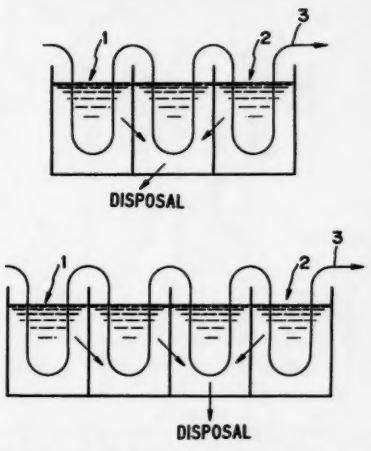
5,063,141

METHOD OF PROCESSING SILVER HALIDE PHOTOSENSITIVE MATERIAL

Takashi Nakamura, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Apr. 9, 1990, Ser. No. 506,255
Claims priority, application Japan, Apr. 10, 1989, 1-90064; Apr. 11, 1989, 1-90982
Int. Cl.[5] G03C 7/00
U.S. Cl. 430—398 19 Claims

1. A method for processing a silver halide photosensitive material comprising developing an exposed silver halide photosensitive material with a developer containing a developing agent in at least two developing tanks, wherein the method further comprises introducing an ordinary developer (mother liquor) into the tanks; feeding a first developing replenisher which mainly comprises the developing agent into the first tank which is the tank photosensitive material to be processed is first introduced; and feeding a second replenisher which mainly comprises an alkali into a tank which is either the last tank or a tank close to the last tank so as to make pH of the developer in this tank higher than that of the developer in first tank and further wherein the developer flows in the same



direction as that of the movement of the photosensitive material.

5,063,142

PROCESS FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Takatoshi Ishikawa, Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 21, 1990, Ser. No. 525,818
Claims priority, application Japan, May 22, 1989, 1-128388
Int. Cl.[5] G03C 7/42
U.S. Cl. 430—400 10 Claims

1. A process for processing a silver halide color photographic material, which comprises color developing and bleach-fixing said silver halide color photographic material, and then processing by at least one of washing said material with water and stabilizing said material, said silver halide color photographic material comprising a support having thereon at least one emulsion layer comprising a high silver chloride emulsion having a silver chloride content of 80 mol % or more and a used bleach-fixing solution which has been already used for said bleach-fixing, having a silver ion concentration of 0.02 mol/liter or more being used as a bleach-fixing solution for replenishment, wherein the silver halide is coated at a silver amount of 0.4 to 0.8 g/m^2 of the silver halide photographic material.

5,063,143

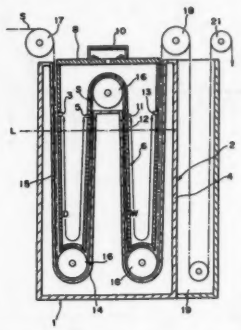
PROCESS FOR FORMING COLOR IMAGE

Takeshi Hirose; Akira Abe, and Kiyoshi Nakazyo, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 9, 1990, Ser. No. 506,201
Claims priority, application Japan, Apr. 10, 1989, 1-90065
Int. Cl.[5] G03C 5/38
U.S. Cl. 430—419 16 Claims

1. A process for forming a color image comprising developing an image-wise exposed color photographic material which comprises a support having at least one layer containing a coupler capable of forming a dye by reaction with an oxidized aromatic primary amino color developing agent and having a dye covering power of at least 0.75, and a silver chlorobromide emulsion or silver chloroiodobromide emulsion containing at

least 90 molar % of silver chloride with a processing solution containing a solvent for the silver halide in the presence of an



aromatic primary amino color developing agent so as to conduct the development and desilverization in one step.

5,063,144

PHOTOGRAPHIC COLOR DEVELOPER SOLUTION AND A PROCESS FOR THE DEVELOPMENT OF A COLOR PHOTOGRAPHIC MATERIAL

Ubbo Wernicke, Colonge, Fed. Rep. of Germany, assignor to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 309,689, Feb. 10, 1989, abandoned. This application Feb. 20, 1991, Ser. No. 657,968

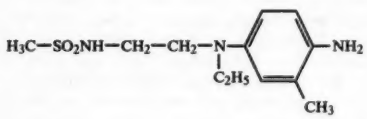
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805699

Int. Cl.[5] G03C *5/30*

U.S. Cl. 430—436 **8 Claims**

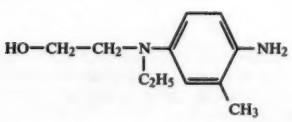
1. Color photographic developer solution for development in a negative process containing, in 1 liter of solution ready for use consisting essentially of

a) from 4 to 15 g of the developer corresponding to the following formula



or a corresponding quantity of salts thereof (CD 3),

b) from 0 to 2.0 g of developer corresponding to the following formula



or a corresponding quantity of salts thereof (CD 4),

c) from 8 to 35 g of PO_4^{3-} ions,

d) at least 0.2 g of antioxidant,

e) from 0.5 to 5.0 g of KCl,

f) from 0 to 0.5 g of KBr,

and one or more conventional components selected from the group consisting of optical brightners, polyalkylene glycols, surface active agents, water softeners, stabilizers, benzyl alcohol and substances for adjusting the pH to from 10.4 to 12.9.

5,063,145

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Ken Sakanoue, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 10, 1989, Ser. No. 308,504

Claims priority, application Japan, Feb. 10, 1988, 63-27602

Int. Cl.[5] G03C *1/43, 1/46*

U.S. Cl. 430—505 **14 Claims**

1. A silver halide color photographic material comprising:

at least one red-sensitive silver halide emulsion layer;

at least one green-sensitive silver halide emulsion layer; and

at least one blue-sensitive silver halide emulsion layer,

wherein said layers are coated on a support and wherein said photographic material comprises at least one compound which reacts with the oxidation product of a color developing agent during development and releases a bleach accelerator, and wherein the swelling factor of said photographic material in a development bath is at least 2.8.

5,063,146

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yoshio Inagaki, and Keiichi Adachi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

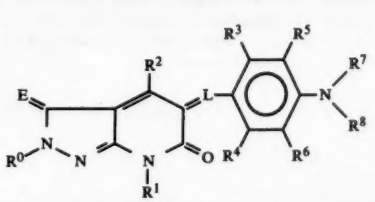
Filed Mar. 1, 1990, Ser. No. 487,078

Claims priority, application Japan, Mar. 2, 1989, 1-50874

Int. Cl.[5] G03C *1/02*

U.S. Cl. 430—522 **18 Claims**

1. A silver halide photographic material having a hydrophilic colloidal layer containing a dispersion of fine solid particles of a dye represented by formula (I):



(I)

wherein L represents a nitrogen atom; E represents O, S, or N-R^9; R^0 and R^9 each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, a substituted or unsubstituted amino group, a substituted or unsubstituted amino group, a substituted or unsubstituted hydrazino group, or a substituted or unsubstituted diazenyl group; R^1 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted akynyl group, or a substituted or unsubstituted heterocyclic group; R^2 represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, a hydroxyl group, a carboxyl group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted heterocyclic group, a substituted or unsubstituted alkoxyl group, a substituted or unsubstituted aryloxycarbonyl group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted arloxycarbonyl group, a substituted or unsubstituted amino group, a substituted or unsubstituted acyloxy group, a substituted or unsubstituted carbamoyl group, a substituted or unsubstituted sulfamoyl group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, or a substituted or unsubstituted alkynyl group; R^0 and R^9 may be connected to each other to from a ring; R^3 and R^4 each represents a hydrogen atom, a halogen atom, an alkoxyl group, an alkyl group, an alkenyl group, an aryloxy group, or an aryl group; R^5 and R^6 each

represents a hydrogen atom or a group capable of substituting a hydrogen atom; R^7 and R^8 each represents an alkyl group, an aryl group, a vinyl group, an acyl group, an alkylsulfonyl group, or an arylsulfonyl group; and R^3 and R^5, R^4 and R^6, R^7 and R^8, R^5 and R^7, or R^6 and R^8 may be connected to each other to form a ring.

5,063,147

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING ALIPHATIC CARBOXYLIC ESTER

Masakazu Yoneyama; Ryosuke Yamada; Yosuke Nishiura; Yukio Maekawa, all of Kanagawa; Yuzo Higaki, Tokyo, and Yoshiaki Iwamoto, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1990, Ser. No. 515,992

Claims priority, application Japan, Apr. 28, 1989, 1-110388; Apr. 28, 1989, 1-110389

Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—523 **18 Claims**

1. A silver halide photographic light-sensitive material comprising a support and a light-sensitive silver halide emulsion layer provided on the support,

wherein a surface layer provided on the photographic light-sensitive material contains an aliphatic carboxylic ester having the formula (I):

$$R^{11}COOR^{12} \quad \text{(I)}$$

in which each of R^{11} and R^{12} independently is analiphatic hydrocarbon group having 12–70 carbon atoms; said R^{12} having a branch at the second position from the carbon atom bonded to the ester group; and the number of the total carbon atoms contained in R^{11} and R^{12} is in the range of 32 to 140.

5,063,148

SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL

Shuichi Sugita; Noboru Mizukura; Junichi Kohno; Kenzi Kadokura, and Atsushi Tomotake, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Apr. 3, 1990, Ser. No. 503,539

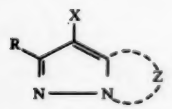
Claims priority, application Japan, Apr. 7, 1989, 1-89304

Int. Cl.[5] G03C *7/32*

U.S. Cl. 430—551 **36 Claims**

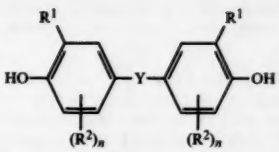
1. A silver halide light-sensitive photographic material comprising a support and provided thereon at least one silver halide emulsion layer, which material contains a compound represented by formula M-1 and at least one compound represented by formula II;

M-I



wherein Z is a nonmetallic atomic group necessary for forming a nitrogen-containing heterocyclic ring, wherein so-formed ring may have a substituent; X is a hydrogen, halogen atom, or a group that is capable of being split off by reaction with an oxidation product of a color developing agent; R is a hydrogen atom or a substituent;

II



wherein R^1 is a secondary or tertiary alkyl group, a secondary or tertiary alkenyl group, a cycloalkyl or an aryl group, R^2 is a halogen atom, an alkyl, alkenyl, cycloalkyl or aryl group, n is an integer of 0 to 3, Y is a S, SO,SO_2 or alkylene group.

5,063,149

PERFORMING AN ENZYME-CATALYZED REACTION

Colin J. Suckling; Peter J. Halling, both of Glasgow; Grant A. Johnston, West Kilbride, and Linda Brown, Glasgow, all of Scotland, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 4, 1989, Ser. No. 389,596

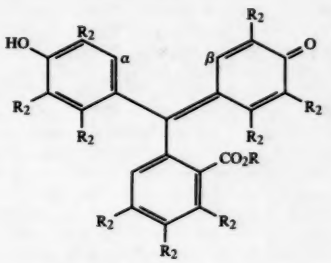
Claims priority, application United Kingdom, Aug. 4, 1988, 8818564; Oct. 14, 1988, 8824145

Int. Cl.[5] C12Q *1/34, 1/44, 1/00;* **C07D** *311/82*

U.S. Cl. 435—4 **4 Claims**

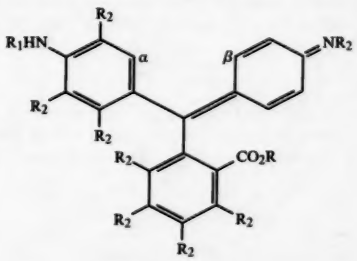
1. A process for performing an enzyme-catalysed reaction in a reaction mixture comprising two phases, a first aqueous phase containing an enzyme and a second substantially non-aqueous phase containing a non-water miscible solvent wherein there is present in the non-aqueous phase a compound having the structural formula (I):

(I)



or a compound having the structural formula (II):

(II)



in which positions alpha and beta can be substituted by hydrogen atoms or can be linked together through a bridge comprising 1 or 2 atoms which may have substituents upon them; R is a substituted or unsubstituted hydrocarbon group or a substituted or unsubstituted amide group; R_1 is a hydrogen atom, or any other group (the individual groups R_1 being the same as or different from each other); and R_2 is a hydrogen atom or any other group (individual groups R_2 being the same as or different from each other); compound of structural formula (I) or

compound of structural formula (II) being present for the purpose of measuring aqueous pH by monitoring spectroscopic properties and calculating the aqueous phase pH therefrom.

5,063,150

RETROVIRAL POLYPEPTIDES ASSOCIATED WITH HUMAN CELLULAR TRANSFORMATION

Dennis J. Slamon, Woodland Hills, and Irvin S. Y. Chen, Sherman Oaks, both of Calif., assignors to The Regents of The University of California, Berkeley, Calif.

PCT No. PCT/US85/01803, § 371 Date Nov. 13, 1987, § 102(e) Date Nov. 13, 1987, PCT Pub. No. WO86/01834, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 19, 1985, Ser. No. 86,088

Int. Cl.[5] G01N *33/569*

U.S. Cl. 435—5 **27 Claims**

1. A polypeptide comprising:

at least 12 amino acids wherein the sequence of said polypeptide includes an epitopic site and wherein said sequence is substantially the same as a sequence from a peptide expressed by an HTLV-I virus or an HTLV-II virus with the proviso that the sequence of said polypeptide is other than the entire native sequence of a 42 kD expression product of the X-region of HTLV-I and comprises at least one of the following sequences or a part thereof:

Sequence (1): C P E H Q $(aa)^{A}$ T W D P I D G R,

Sequence (2): I P R L P S F P T Q R T S $(aa)^{B}$ T L K,

Sequence (3): K$(aa)^{ArB}$ $(aa)^{Ah}$ P $(aa)^{Ar}$ RNG $(aa)^{ArS}$ $(aa)^{AS}$ EPTLG $(aa)^{AcAm}$ $(aa)^{AmB}$ LP $(aa)^{Ah}$ L $(aa)^{AAh}$ FP $(aa)^{Ac}$ PGLRPQN $(aa)^{A}$ YT $(aa)^{AAh}$ WG $(aa)^{AB}$ $(aa)^{Ah}$ VVC $(aa)^{AS}$ YLYQLSPP $(aa)^{AS}$ TWPL $(aa)^{A}$ PHVIFCHP $(aa)^{AB}$ Q, and

Sequence (4): V $(aa)^{A}$ QSS $(aa)^{AAh}$ $(aa)^{AAr}$ IF $(aa)^{AcB}$ KF $(aa)^{AcAm}$ TKA $(aa)^{Ar}$ HPS $(aa)^{Ar}$ LLSH $(aa)^{AAm}$ LIQY SSFH $(aa)^{AhAm}$ LHLLF $(aa)^{Ac}$ EYTNIP $(aa)^{A}$ S $(aa)^{A}$ LFN $(aa)^{AcB}$ $(aa)^{AcB}$ EADDN $(aa)^{AAc}$ $(aa)^{AcB}$ EPQISPG-GLEPPSEKH FRETEV

wherein $(aa)^{A}$, $(aa)^{Ac}$, $(aa)^{Ah}$, $(aa)^{Am}$, $(aa)^{Ar}$, $(aa)^{B}$, $(aa)^{ArB}$, $(aa)^{ArS}$, $(aa)^{AS}$, $(aa)^{AcAm}$, $(aa)^{AmB}$, $(aa)^{AAh}$, $(aa)^{AB}$, $(aa)^{AAr}$, $(aa)^{AcB}$, $(aa)^{AhAm}$, $(aa)^{AAc}$, and $(aa)^{S}$ may be the same or different and are selected from any one of the twenty naturally occurring amino acids found in proteins, and wherein superscript A designates an aliphatic amino acid, superscript Ac designates an acidic amino acid, superscript Ah designates an amino acid having an aliphatic-hydroxyl side chain, superscript Am designates an amino acid having an amine-containing side chain, superscript Ar designates aromatic amino acid, superscript B designates a basic amino acid, superscript S designates an amino acid having a sulfur-containing side chain, and combinations of two superscripts indicate amino acids that may be from any of the amino acids designated by either superscript.

5,063,151

IMMUNOASSAY METHOD AND KIT

Christa G. Kuehn, Princeton Junction, N.J.; Debra J. Rossi, Yardley, Pa., and Stephan S. Isied, Princeton, N.J., assignors to Biometallics, Inc., Princeton, N.J.

Filed Sep. 20, 1985, Ser. No. 778,554

Int. Cl.[5] G01N *33/535, 33/554*

U.S. Cl. 435—7.33 **40 Claims**

1. A method of binding and stabilizing antibody with protein A-positive-formalin-treated, heat-killed *Staphylococcus aureus* cells comprising the steps of:

a) incubating protein A-positive-formalin-treated, heat-killed *Staphylococcus aureus* cells with antibody to form treated cells of protein A-positive-formalin-treated, heat-killed *Staphylococcus aureus* with antibody attached thereto;

b) adding untreated cells of protein A-positive-formalin-treated, heat-killed *Staphylococcus aureus* to the treated cells;

c) adding to the treated and untreated cells an agent for cross-linking the antibody with the treated cells;

d) adding to the treated and untreated cells an agent for deactivating the agent for cross-linking the antibody with the treated cells.

5,063,152

SYNTHETIC PEPTIDIC SUBSTRATE FOR DETERMINATION OF TRYPSIN AND α_1-ANTITRYPSIN

Takeshi Nagasawa, Urawa; Yuko Gemba, Fukushima; Yoshio Nakamura, and Katsumasa Kuroiwa, both of Koriyama, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

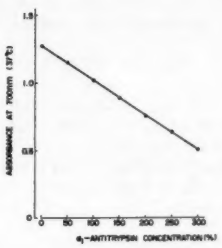
Division of Ser. No. 934,249, Nov. 21, 1986, Pat. No. 4,894,438.

This application Sep. 20, 1989, Ser. No. 410,099

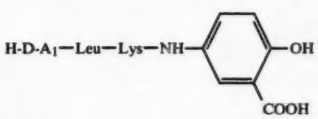
Claims priority, application Japan, Nov. 26, 1985, 60-265388

Int. Cl.[5] C12Q *1/37*

U.S. Cl. 435—24 **3 Claims**



1. A process for determining the concentration of trypsin or alpha$_1$-antitrypsin in a serum sample, in vitro which comprises admixing said sample with a synthetic peptide substrate of the formula



wherein A_1 is a prolyl (Pro) or alanyl (Ala) group; Leu is a leucyl group; and Lys is a lysyl group, or an acid addition salt thereof to cause an enzymatic reaction, terminating said enzymatic reaction and determining the concentration of trypsin or alpha$_1$-antitrypsin in said admixture.

5,063,153

INTEGRAL MULTILAYER ANALYTICAL ELEMENT

Fuminori Arai; Takeshi Igarashi, and Mitsutoshi Tanaka, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 9, 1987, Ser. No. 107,674

Claims priority, application Japan, Oct. 9, 1986, 61-240288; Nov. 6, 1986, 61-265090; Nov. 6, 1986, 61-265091

Int. Cl.[5] C12Q *1/32;* G01N *31/22*

U.S. Cl. 435—26 **8 Claims**

1. A process for the preparation of a dry integral multilayer analytical element having reagent layers containing a dehydrogenase, oxidized nicotinamide coenzyme, an electron transport compound, an electron acceptable dye-forming compound, an alkali agent or an alkaline buffer selected from the group consisting of 2-amino-2-methyl-1,3-propanediol, 2-amino-2-ethyl-1,3-propanediol, diethanolamine, ethanolamine, 2-amino-2-methyl-1-propanediol, tris(hydroxymethyl)aminomethane and trimethylamine provided on a light-transmissive, water-impermeable support which comprises the steps of:

forming on said support a reagent layer containing at least said oxidized nicotinamide coenzyme and electron accept-

able dye-forming compound dispersed in a hydrophilic polymer;

forming a spreading layer having a metering effect;

coating a solution or dispersion containing at least said alkali agent or alkaline buffer in an organic solvent which causes substantially no swelling of the hydrophilic polymer in the underlying reagent layer over the spreading layer; and

drying the coated layers.

5,063,154

PHEROMONE - INDUCIBLE YEAST PROMOTER

Gerald R. Fink, Brookline, Mass.; Joshua Trueheart, San Francisco, Calif., and Elaine A. Elion, Somerville, Mass., assignors to Whitehead Institute for Biomedical Research, Cambridge, Mass.

Continuation-in-part of Ser. No. 66,078, Jun. 24, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 212,270

Int. Cl.[5] **C12N** *1/19, 15/31, 15/81*

U.S. Cl. 435—69.1 **33 Claims**

1. A DNA fragment comprising the promoter of the FUS1 gene isolated from *Saccharomyces cerevisiae*, operably linked to DNA encoding at least one polypeptide not normally expressed at substantial levels in Saccharomyces cells, transcription of the Saccharomyces promoter inducible by a Saccharomyces mating pheromone, for directing the expression of the polypeptide-encoding DNA in Saccharomyces cells.

5,063,155

METHOD FOR PRODUCING 2'''-O-DEMETHYLTYLOSIN

Karen L. Cox, Martinsville; Eugene T. Seno, and Gene M. Wild, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianpolis, Ind.

Filed Mar. 28, 1988, Ser. No. 173,860

Int. Cl.[5] **C12N** *1/21, 15/52, 15/76;* **C12P** *19/62*

U.S. Cl. 435—76 **10 Claims**

1. A method for producing 2'''-O-demethyltylosin by a microorganism that is a mutant of a tylosin-producing species of *Streptomyces fradiae* containing a mutation that prevents the expression of tylosin biosynthetic gene tylE, comprising:

a) transforming the strain with a recombinant DNA cloning vector that comprises DNA which codes for the expression of *Streptomyces fradiae* tylF in the strain; and

b) culturing the transformed strain under conditions suitable for cell growth, expression of tylF, and subsequent production of 2'''-O-demethyltylosin.

5,063,156

PROCESS FOR THE FERMENTATIVE PRODUCTION OF ACETONE, BUTANOL AND ETHANOL

David A. Glassner, 4454 Satinwood Rd.; Mahendra K. Jain, 3950 Jonquil La., both of Okemos, Mich. 48864, and Rathin Datta, 442 W. Melrose Ave., #3, Chicago, Ill. 60657

Filed Apr. 30, 1990, Ser. No. 516,618

Int. Cl.[5] **C12P** *7/28, 7/30, 7/06;* **C12R** *1/145*

U.S. Cl. 435—150 **4 Claims**

1. The improved process for the production of butanol, acetone and ethanol, by the fermentation of an asporogenic microorganism capable of producing butanol, acetone and ethanol upon a medium containing assimilable carbohydrate and nutrients which comprises conducting the fermentation in at least two continuous fermentors connected in series at a temperature of about 33° to about 38° C. at a pH of about 4.8 to about 5.5 to produce maximum growth of the microorganism and organic acids and then subjecting the effluent from the continuous fermentors to batch fermentation at a temperature of about 24° C. to about 30° C. to complete the fermentation.

5,063,157

SERUM-FREE CULTURE MEDIUM FOR MAMMALIAN CELLS

Hubertus Stockinger, Penzberg, Fed. Rep. of Germany, assignor to Boefringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jan. 11, 1989, Ser. No. 295,813

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1988, 3801236

Int. Cl.[5] **C12N** *5/00, 5/02;* **C12Q** *1/68*

U.S. Cl. 435—240.2 **17 Claims**

1. A method for culturing non-adherent mammalian cells comprising culturing said cells in a medium consisting essentially of

a base medium,

2–10 mg/liter of transferrin

2–10 mg/liter of insulin

1–10 g/liter of peptone

10–500 mg/liter beta-D-xylopyranose of a molecular weight range of 1,000–10,000 Dalton. substituted by at least one of a phosphate, carboxyl or sulphate group,

0.1–0.5 mg/liter selenite, and

0.1–2 mg/liter biological polyamine.

5,063,158

RECOMBINANT DNA EXPRESSION VECTOR COMPRISING BOTH TRANSCRIPTIONAL AND TRANSLATIONAL ACTIVATING SEQUENCES

Brigitte E. Schoner, and Ronald G. Schoner, both of Monrovia, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 118,678, Nov. 9, 1987, abandoned. This application Dec. 12, 1989, Ser. No. 449,199

Int. Cl.[5] **C12N** *15/67, 15/09;* **C07N** *15/12*

U.S. Cl. 435—252.3 **31 Claims**

1. A recombinant DNA expression vector which sequentially comprises

a) a transcriptional activating sequence,

b) a translational activating sequence selected from the group consisting of

```
5'-CTAGAGGGTATTAATAATCTATCGATTA                    1)
    |||||||||||||||||||||||||||
3-      TCCCATAATTATTAGATAGCTAAT

        AATAAGGAGGAATAACA  -3'
        |||||||||||||||||
        TTATTCCTCCTTATTGTAT-5'

5'-CTAGAGGGTATTAATAATCTATCGATTT                    2)
    |||||||||||||||||||||||||||
3-      TCCCATAATTATTAGATAGCTAAA

        AAATAAGGAGGAATAACA  -3'
        |||||||||||||||||
        TTTATTCCTCCTTATTGTAT-5'

5'-CTAGAGGGTATTAATAATCTATCGATTT                    3)
    |||||||||||||||||||||||||||
3-      TCCCATAATTATTAGATAGCTAAA

        AAAAAAGGAGGAATATAA  -3'
        |||||||||||||||||
        TTTTTTCCTCCTTATATTAT-5'

5'-CTAGCGATTAAATAAGGAGGAATAACA  -3'                4)
    |||||||||||||||||||||||||||
3-      GCTAATTTATTCCTCCTTATTGTAT-5'

5'-CTAGCGGATCCGCGATTAAATAAGGAGG                    5)
    |||||||||||||||||||||||||||
3-      GCCTAGGCGCTAATTTATTCCTCC

        AATAACA  -3'
        |||||||
        TTATTGTAT-5'

5'-CTAGCGTTAACGCGATTAAATAAGGAGG
    |||||||||||||||||||||||||||
3-      GCAATTGCGCTAATTTATTCCTCC
```

-continued

```
      AATAACA  -3'
      |||||||
      TTATTGTAT-5'

5'-CTAGCGATTTAAATAAGGAGGAATAACA  -3'
   |||||||||||||||||||||||||||||
3'-   GCTAAATTTATTCCTCCTTATTGTAT-5'
```

and

```
5'-CTAGCGGGATCCCGCGATTTAAATAAGG
   |||||||||||||||||||||||||||
3'-   GCCCTAGGGCGCTAAATTTATTCC

      AGGAATAACA  -3'
      ||||||||||
      TCCTTATTGTAT-5'
```

wherein

A is deoxyadenhyl,

G is deoxyguanyl,

C is deoxycytidyl,

T is thymidyl, and

c) a DNA sequence that codes for a functional polypeptide with a methionine as the first amino acid at the amino-terminus; subject to the limitation that sequences a and b are positioned for microbial expression of sequence c.

5,063,159

INTERFERON-INDUCED (2'-5') OLIGO A SYNTHETASE GENE, MRNA, CDNA AND ENZYMES HAVING (2'-5') OLIGO A SYNTHETASE ACTIVITY

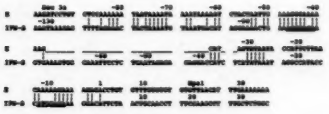
Michel Revel, and Judith Chebath, both of Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 601,782, Apr. 18, 1984, abandoned. This application Feb. 25, 1986, Ser. No. 833,212

Claims priority, application Israel, Aug. 26, 1985, 76233

Int. Cl.[5] C12N *1/21, 9/00, 15/52, 15/70*

U.S. Cl. 435—252.3 **11 Claims**



1. An isolated human DNA molecule encoding an enzyme having (2'-5') oligo A synthetase activity and having the restriction enzyme sites set forth in FIG. 9.

5,063,160

IDENTIFICATION, CHARACTERIZATION, AND METHOD OF PRODUCTION OF A NOVEL MICROBIAL LIPASE

Paul E. Holmes, Hamden, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Mar. 16, 1989, Ser. No. 324,062

Int. Cl.[5] C12N *1/20, 9/20*

U.S. Cl. 435—253.3 **4 Claims**

1. A biologically-pure culture of the microorganisms *Pseudomonas alcaligenes* strain SD2 having all of the identifying characteristics of ATCC 53877 and derivatives and mutants thereof.

5,063,161

METHOD OF DEGRADING KERATINACEOUS MATERIAL AND BACTERIA USEFUL THEREFOR

Jason C. H. Shih, and C. Michael Williams, both of Cary, N.C., assignors to North Carolina State University, Raleigh, N.C.

Division of Ser. No. 175,476, Mar. 31, 1988, Pat. No. 4,959,311.

This application Sep. 13, 1990, Ser. No. 581,681

Int. Cl.[5] C12N *1/20, 1/00;* **C12P** *21/00*

U.S. Cl. 435—252.5 **2 Claims**

1. A biologically pure culture of a keratinaceous material degrading microorganism having the identifying characteristics of *Bacillus licheniformis* PWD-1, ATCC Accession No. 53757.

5,063,162

PROCESS FOR ISOLATING NUCLEIC ACIDS UTILIZING PROTEASE DIGESTION

Hansruedi Kiefer, Riehen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 175,885, Apr. 1, 1988, Pat. No. 4,946,952.

This application May 9, 1990, Ser. No. 520,929

Int. Cl.[5] C12S *3/20;* **C12N** *9/50, 15/12*

U.S. Cl. 435—270 **6 Claims**

1. A process for isolating nucleic acids from a eukaryotic cell or tissue extract comprising:

(a) Preparing an extract of eukaryotic cells or tissue;

(b) treating the extract with a nonspecific protease that is active in the presence of detergents to degrade the proteins in the extract;

(c) treating the extract of step (b) with an excess of an aqueous solution containing at least 60% by volume acetone or an analogous water-soluble ketone to produce a mixture containing precipitated nucleic acids; and

(d) separating the precipitated nucleic acids from the mixture.

5,063,163

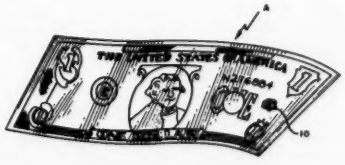
METHOD OF DETECTING COUNTERFEIT PAPER CURRENCY

Dov Carmeli, Tampa, Fla., assignor to Ach Group, Inc., Tampa, Fla.

Filed Mar. 20, 1990, Ser. No. 496,349

Int. Cl.[5] G01N *33/10, 33/34*

U.S. Cl. 436—94 **16 Claims**



1. A method of determining illegitimate paper currency by detecting the starch content therein in excess of the genuine currency, comprising the steps of:

(a) providing a paper currency to be tested;

(b) providing a test solution including iodine and having an initial color;

(c) applying said test solution to an area of said paper currency;

(d) waiting for a predetermined time period; and

(e) comparing the color of said area of said paper currency with a predetermined standard to determine if a reaction has taken place;

(f) whereby on the application of said test solution to a counterfeit paper currency the net result will be a color change from its initial color to a black coloration due to the reaction with starch in the counterfeit paper currency

and for a genuine paper currency there will be no immediate change in its initial color.

5,063,164

BIOMIMETIC SENSOR THAT SIMULATES HUMAN RESPONSE TO AIRBORNE TOXINS

Mark K. Goldstein, San Diego, Calif., assignor to Quantum Group, Inc., San Diego, Calif.

Filed Jun. 29, 1990, Ser. No. 546,543
Int. Cl.[5] G01N *21/77*
U.S. Cl. 436—169 24 Claims

1. A biomimetic sensor for detecting the presence of airborne toxins comprising:

a porous, semi-transparent substrate that is transmissive to light;

means for detecting light transmitted through the substrate;

a self-regenerating chemical sensor reagent for detecting airborne toxins, wherein the self-regenerating chemical sensor is able to regenerate itself for a period of at least one year at ambient conditions; and

a molecular encapsulant encapsulating at least one component, but not all the components, of the chemical sensor reagent.

5,063,165

GEMINAL DIPHENYL DERIVATIVES AND THEIR USE IN IMMUNOASSAYS

Mae W. Hu, Los Altos Hills; Kirk Schulkamp; Cheng-I Lin, both of San Jose, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 22, 1988, Ser. No. 289,998
Int. Cl.[5] G01N *33/78, 33/53*
U.S. Cl. 436—500 23 Claims

1. A method for inactivating interfering binding proteins in an assay for a member of a specific binding pair (sbp), which comprises including in an assay medium containing a sample suspected of containing said sbp member an effective amount of a water soluble compound having two substituted or unsubstituted phenyl groups linked to a common atom with the proviso that, when said sbp member or its sbp partner has two phenyl groups linked through a common atom, said compound has a number of groups other than hydrogen attached to said phenyl groups and/or said atom such that said number differs by at least two from the number of such groups on said sbp member and when said sbp member or its sbp partner has two phenyl groups linked to a common atom and the interfering binding protein is not an antibody, the compound has only one group other than hydrogen attached to a phenyl group or the common atom.

4. The method of claim 1 wherein the interfering binding protein is thyroxine binding globulin.

5,063,166

METHOD OF FORMING A LOW DISLOCATION DENSITY SEMICONDUCTOR DEVICE

John B. Mooney, San Jose, and Arden Sher, San Carlos, both of Calif., assignors to SRI International, Menlo Park, Calif.

Division of Ser. No. 187,939, Apr. 29, 1988, Pat. No. 4,916,088.
This application Apr. 9, 1990, Ser. No. 506,051
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—22 24 Claims

1. A method of forming a low dislocation density semiconductor device comprising the step of forming a layer of a III-V or II-VI compound in a bulk semiconductor substrate of the compound by burying in the substrate a sufficient quantity of alloying atoms to cause the alloying atoms to be supersaturated in the compound of the substrate and enable the layer to have a low dislocation density relative to the dislocation density of a layer of the same material without the alloying atoms, the alloying atoms being of a type to form an isoelectronic compound with the substrate compound and being buried by bombarding the substrate with an ion beam of the alloying atoms, and adding energy to the buried alloying atoms to cause the alloying atoms to move from random positions thereof in the

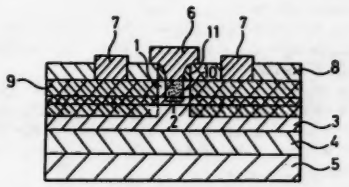
substrate to lattice positions of the substrate semiconductor where the layer has said low dislocation density.

5,063,167

METHOD OF PRODUCING A BIPOLAR TRANSISTOR WITH SPACERS

Teruyuki Shimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 217,292, Jul. 11, 1988, Pat. No. 4,967,254.
This application Aug. 28, 1990, Ser. No. 573,698
Claims priority, application Japan, Jul. 16, 1987, 62-179343; Jul. 16, 1987, 62-179344
Int. Cl.[5] H01L *21/331*
U.S. Cl. 437—31 6 Claims



1. A method of producing a semiconductor device comprising:

successively depositing a collector layer comprising a first conductivity type semi-conductor layer, a base layer comprising a second conductivity type semiconductor layer, an emitter layer comprising a first conductivity type semiconductor layer, and a contact layer comprising an undoped semiconductor layer on a sub-collector layer comprising a first conductivity type semi-conductor layer;

depositing a resist pattern on said contact layer which becomes a mash for a first ion implantation region;

ion implanting second conductivity type impurity ions from the surface of said contact layer through said contact and emitter layers and into said base layer using said resist pattern as a mask to produce a second conductivity type first implanation region;

depositing first insulating films on the surfaces of said second conductivity type first implantation regions;

removing said resist pattern and depositing a second insulating material on said first insulating films and the area from which the resist pattern was removed;

etching said second insulating material to leave walls of said second material in the area from which the resist pattern was removed adjacent said first insulating films; and

ion implanting first conductivity type impurity ions from the surface of said contact layer through said contact and

emitter layers and into said emitter layer to produce a first conductivity type second implanation region.

5,063,168

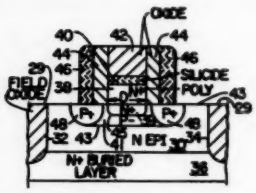
PROCESS FOR MAKING BIPOLAR TRANSISTOR WITH POLYSILICON STRINGER BASE CONTACT

Madhukar B. Vora, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 248,300, Sep. 21, 1988, Pat. No. 4,974,046, which is a continuation of Ser. No. 881,155, Jul. 2, 1986, abandoned. This application Mar. 13, 1990, Ser. No. 493,071

Int. Cl.[5] H01L *21/331, 21/283*

U.S. Cl. 437—31 **14 Claims**



1. A process for making a base and emitter contact structure for a transistor comprising the steps of:

forming an isolated island of monocrystalline silicon;

forming a layer of polysilicon covered by a first layer of metal disilicide;

doping the first metal disilicide layer with both P type and N type impurities where the impurities are selected such that the lower concentration impurity has a faster diffusion rate in terms of distance travelled per unit time for given diffusion conditions;

forming a layer of insulating material over said metal disilicide;

etching said combined three layers into the shape of an emitter contact stripe which crosses said island and which has an emitter contact pad located external to said island;

forming a second layer of insulating material over the etched structure;

anisotropically etching the second insulating layer until all the insulating material in planes parallel to the surface of said island is removed;

forming a layer of metal disilicide over the structure;

doping said second metal disilicide layer with impurities of the conductivity type which will exist in the base region of the final transistor;

masking a portion of said second metal disilicide layer which is to be the base contact pad at a location outside said island;

anisotropically etching away all portions of said second metal disilicide layer which lie in planes parallel to the surface of said island except that portion under said mask; and

baking the resultant structure in an oven long enough and at a temperature sufficient to allow the impurities in said first metal disilicide layer to diffuse into said polysilicon and said monocrystalline silicon sufficiently to form an emitter region of the desired depth and a base region of the desired width which is in electrical contact with said stringers of said second metal disilicide layer.

5,063,169

SELECTIVELY PLATING CONDUCTIVE PILLARS IN MANUFACTURING A SEMICONDUCTOR DEVICE

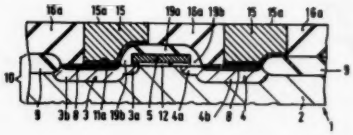
Leendert De Bruin; Robertus D. J. Verhaar, and Josephus M. F. G. Van Laarhoven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1990, Ser. No. 531,825

Claims priority, application United Kingdom, Jun. 26, 1989, 8914627

Int. Cl.[5] H01L *21/445*

U.S. Cl. 437—41 **10 Claims**



1. A method of manufacturing a semiconductor device, which method comprises providing a semiconductor body having adjacent one major surface a device region bounded by an insulating region and forming an electrical connection to the device region by providing an activating layer on the one major surface, applying a photosensitive resist material to form a photosensitive resist layer on the one major surface, exposing and developing the photosensitive resist layer to define an opening through the photosensitive resist layer thereby exposing a contact area of the device region, and selectively depositing conductive material into the opening to form a conductive pillar which pillar has a top surface and which pillar is in electrical contact with the contact area, removing the photosensitive resist layer after formation of the conductive pillar, providing a layer of an inorganic insulating material to cover the conductive pillar and said major surface, applying a resist layer to the inorganic insulating material layer and etching the insulating and resist layers at the same rate to expose the top surface of the electrically conductive pillar and to provide a relatively flat surface for the insulating material bounding the conductive pillar.

5,063,170

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND A METHOD OF PRODUCING THE SAME

Kousuke Okuyama, Kawagoe, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

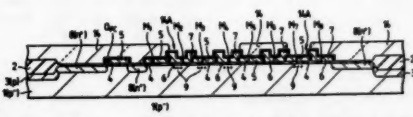
Continuation of Ser. No. 269,702, Nov. 10, 1988, Pat. No. 4,898,840. This application Jan. 2, 1990, Ser. No. 460,011

Claims priority, application Japan, Nov. 13, 1987, 62-285318

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[5] H01L *21/00, 21/02, 21/265;* **B01J** *17/00*

U.S. Cl. 437—41 **19 Claims**



1. A method of producing a semiconductor device having a memory cell array, said memory cell array having a plurality of MISFET's that are connected in series and form cell rows, comprising the steps of:

introducing impurities into a surface of a semiconductor material having a first type of conductivity, said impurities having a second type of conductivity that is opposite to said first type of conductivity;

forming a plurality of first conductive layers maintaining an

equal distance on the surface of said semiconductor material;

forming a plurality of second conductive layers among said plurality of first conductive layers on the surface of said semiconductor material, in such a manner that said second conductive layers are partly overlapped on said first conductive layers, said first and second conductive layers constituting gate electrodes of said MISFET's that are connected in series, said MISFET's forming said cell rows;

forming a masking layer having openings at positions corresponding to particular ones of the plurality of first and second conductive layers; and

selectively introducing impurities of the first conductivity type into the openings utilizing said masking layer, wherein said impurities of the first conductivity type are introduced into the channel-forming regions of said MISFET's.

5,063,171

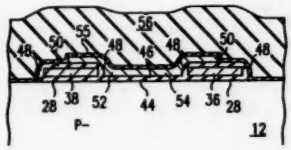
METHOD OF MAKING A DIFFUSIONLESS VIRTUAL DRAIN AND SOURCE CONDUCTOR/OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR

Manzur Gill, Rosharon, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 6, 1990, Ser. No. 505,802

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—41 **6 Claims**



1. A method for fabricating at least one diffusionless field effect transistor at a face of a semiconductor layer having a first conductivity type, comprising the steps of:

forming a thin insulator layer over the face of the semiconductor layer;

forming first and second diffused regions, each of a second conductivity type opposite the first conductivity type, the first diffused region formed to lie adjacent a future source conductor, the second diffused region formed to lie adjacent a future drain conductor;

forming a first conductor layer over the layer of thin insulator;

selectively etching the first conductor layer to define a source conductor and a drain conductor, laterally spaced apart by a channel region of the semiconductor layer;

forming a first interlayer insulator, layer overlying the source and drain conductors and the channel region;

forming a second conductor layer over the first interlayer insulator layer;

selectively etching the source conductor layer to define a gate conductor insulatively overlying the channel region;

forming a second interlayer insulator layer overlying the gate conductor; and

forming a first metal contact terminating at the first diffused region and a second metal contact terminating at the second diffused region.

5,063,172

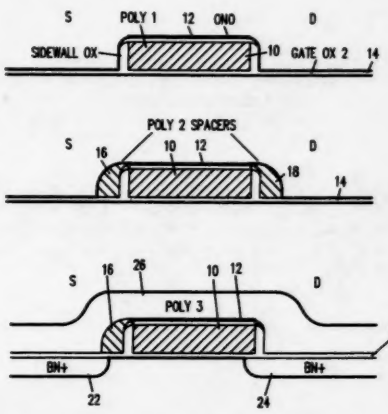
MANUFACTURE OF A SPLIT-GATE EPROM CELL USING POLYSILICON SPACERS

Martin H. Manley, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 545,397, Jun. 28, 1990. This application Feb. 5, 1991, Ser. No. 650,740

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—43 **4 Claims**



1. A method of forming a split-gate memory cell in a semiconductor substrate of a first conductivity type, the method comprising the steps of:

(a) forming a conductive floating gate overlying the substrate but electrically insulated therefrom by a layer of first dielectric material, the floating gate having a layer of second dielectric material formed thereon;

(b) forming a sidewall insulator on a first edge of the floating gate;

(c) forming a conductive spacer adjacent to the first edge of the floating gate but insulated therefrom by the sidewall insulator;

(d) forming first and second regions of a second conductivity type in the substrate using a second edge of the floating gate to define an edge of the first region, and using an edge of the conductive spacer to define an edge of the second region;

(e) forming a conductive control gate in electrical contact with the conductive spacer and overlying but electrically insulated from the floating gate by the layer of second dielectric material.

5,063,173

METHOD FOR MIRROR PASSIVATION OF SEMICONDUCTOR LASER DIODES

Marcel Gasser, Zurich, and Ernst E. Latta, Adliswil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1990, Ser. No. 538,626

Claims priority, application European Pat. Off., Oct. 10, 1989, 89810668

Int. Cl.[5] H01L *21/203*

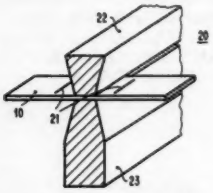
U.S. Cl. 437—129 **7 Claims**

1. A method for passivating semiconductor laser diodes, comprising the steps of:

(a) providing a layered semiconductor structure forming the active waveguide of a laser diode;

(b) processing said layered semiconductor structure in an environment free of contamination so as to provide contamination-free mirror facets in order to terminate said

active waveguide and define the length of the laser diode cavity, and



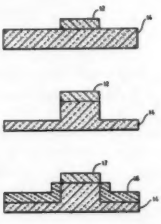
(c) depositing a passivation layer of material selected from a group comprised of silicon, germanium and antimony, in-situ onto said contamination-free mirror facets in said environment which is free of contamination.

5,063,174

SI/AU/NI ALLOYED OHMIC CONTACT TO N-GAAS AND FABRICATING PROCESS THEREFOR

Dana M. Beyea, Londonderry, N.H., and Kathleen Meehan, Medford, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 18, 1990, Ser. No. 585,015
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—184 **16 Claims**



1. A process for fabricating a Si/Au/Ni alloyed ohmic contact to n-type GaAs substrate comprising the steps of:
depositing a Si layer on the n-type GaAs substrate;
depositing a Au layer on the Si layer;
depositing a Ni layer on the Au layer; and
thermally annealing the GaAs substrate with its deposited Si, Au and Ni layers thereon for sufficient time to allow the Si, Au and Ni layers to interdiffuse with one another so that the Au and Ni reach the GaAs substrate.

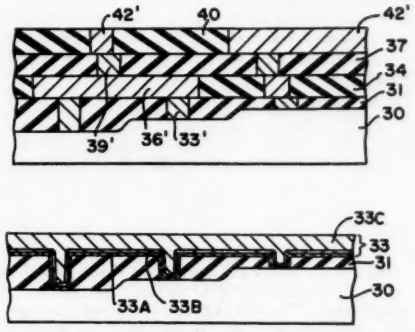
5,063,175

METHOD FOR MANUFACTURING A PLANAR ELECTRICAL INTERCONNECTION UTILIZING ISOTROPIC DEPOSITION OF CONDUCTIVE MATERIAL

Eliot K. Broadbent, San Jose, Calif., assignor to North American Philips Corp., Signetics Division, Sunnyvale, Calif.

Continuation of Ser. No. 224,275, Jul. 25, 1988, abandoned, which is a continuation of Ser. No. 913,428, Sep. 30, 1986, abandoned. This application Dec. 16, 1988, Ser. No. 287,582
Int. Cl.[5] H01L *21/44, 21/48*
U.S. Cl. 437—192 **30 Claims**

1. A method wherein a first electrically insulating layer having a largely planar upper surface is formed on a substructure, and first openings are etched through the first insulating layer down to the substructure, characterized by the steps of:
forming a first electrically conductive planarizing layer having a largely planar upper surface on the first insulating layer and in the first openings by an operation in which tungsten or molybdenum is isotropically deposited to create at least a portion of the first planarizing layer extending from its upper surface partway into the first openings;
removing a relatively uniform thickness of the first planarizing layer down to the upper surface of the first insulating layer;
forming a second electrically insulating layer having a largely planar upper surface on the first insulating layer and on the material in the first openings;
etching second openings through the second insulating layer down to the material in the first openings;
forming a second electrically conductive planarizing layer having a largely planar upper surface on the second insulating layer and in the second openings by an operation in which tungsten or molybdenum is isotropically deposited to create at least a portion of the second planarizing layer extending from its upper surface partway into the second openings; and
removing selected material of the second planarizing layer so as to leave the remainder of the second planarizing layer in a desired pattern; where each isotropic deposition entails providing tungsten or molybdenum from a species in a vapor by a surface-controlled chemical reaction in the immediate vicinity of where the tungsten or molybdenum accumulates.

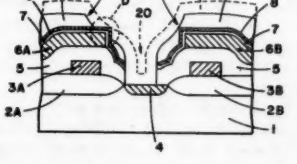


5,063,176

FABRICATION OF CONTACT HOLE USING AN ETCH BARRIER LAYER

Won G. Lee, Kangwon, and Mi Y. Kang, Seoul, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyungki, Rep. of Korea

Filed May 30, 1990, Ser. No. 530,644
Claims priority, application Rep. of Korea, May 30, 1989, 89-7209
Int. Cl.[5] H01L *21/441, 21/465*
U.S. Cl. 437—195 **8 Claims**



1. A method for forming a contact hole by utilizing an etch barrier layer in a semiconductor device, the method comprising the steps of:

forming MOSFETs on a silicon substrate, each MOSFET having a field oxide film formed on the silicon substrate, a gate electrode formed on the field oxide film and a diffusion region formed into the silicon substrate between the field oxide films with the diffusion region being used as a source electrode or a drain electrode;

depositing a first insulating film on the entire surface;

forming conductive material layers on each portion of the first insulating film positioned on the gate electrodes of each MOSFET by a mask patterning process of the conductive material layer;

depositing a second insulating film on the entire surface to insulate the conductive material layers from each other;

forming an etch barrier layer on the second insulating film;

depositing a third insulating film on the entire surface of the etch barrier layer and then flowing the same;

forming a contact mask pattern for contact hole on the third insulating film positioned over the source electrode by utilizing a photoresistive layer as a contact mask; and

performing a rounding process of a portion of the third insulating film by isotropically etching a portion of the third insulating film along the contact mask pattern; and,

forming a contact hole by anisotropically etching a portion of the rounded third insulating film, a portion of the etch barrier layer, a portion of the second insulating film and a portion of the first insulating film, thereby preventing the second insulating film from being etched when the rounding process of a portion of the third insulating is performed by isotropically etching a portion of the third insulating film.

5,063,177

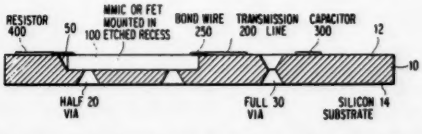
METHOD OF PACKAGING MICROWAVE SEMICONDUCTOR COMPONENTS AND INTEGRATED CIRCUITS

Bernard D. Geller, Rockville; Johann U. Tyler, Mt. Airy; Louis B. Holdeman, Boyds; Fred R. Phelleps, Gaithersburg, and George F. Laird, III, Baltimore, all of Md., assignors to COMSAT, Washington, D.C.

Filed Oct. 4, 1990, Ser. No. 592,750

Int. Cl.[5] H01L *21/60*

U.S. Cl. 437—209 **15 Claims**



1. A method of packaging gallium arsenide monolithic microwave integrated circuits (MMICs), comprising:

(i) etching recesses in a first major surface of a silicon motherboard (SMB);

(ii) etching vias at least from a second major surface of said SMB to a bottom of said recesses; and

(iii) depositing said MMICs in said recesses; wherein said SMB comprises silicon having a resistivity of at least 8 kΩ cm and being operable to conduct energy at RF frequencies.

5,063,178

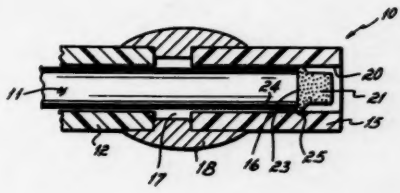
FREEZE-DRIED BLOOD GAS SENSOR

John C. Toomey, West Worthington, Ohio, assignor to Medex, Inc., Hilliard, Ohio

Filed Mar. 19, 1990, Ser. No. 495,849

Int. Cl.[5] G01N *21/64, 31/22;* **G02B** *23/26*

U.S. Cl. 422—82.07 **7 Claims**



4. A blood chemical sensor comprising:

an optical fiber,

a dye and hydrogel combination mounted on the end of the optical fiber, said dye and hydrogel combination being freeze-dried.

5,063,179

PROCESS FOR MAKING NON-POROUS MICRON-SIZED HIGH PURITY SILICA

Jameel Menashi, Lexington, Mass., and Kenneth C. Koehlert, Champaigne, Ill., assignors to Cabot Corporation, Waltham, Mass.

Filed Mar. 2, 1990, Ser. No. 490,005

Int. Cl.[5] C03C *3/06;* **C01B** *33/12*

U.S. Cl. 501—12 **11 Claims**

1. A process for producing nonporous, dense, silica particles having a diameter of about 3 to 1000 microns, and nitrogen B.E.T. surface area less than about 1 m^2/g, a total impurity content of less than about 50 ppm and a metal impurity content of less than about 15 ppm, comprising:

a) Forming an aqueous dispersion of fumed silica containing from about 5 to about 55 weight percent solids;

b) Converting the aqueous dispersion of step (a) into porous particles; and

c) Sintering the porous particles of step (b) in an atmosphere having a water partial pressure ranging from 0.2 to 0.8 atmosphere at temperatures below about 1200° C.

5,063,180

LOW SILICA CERAMIC FIBER

Robert B. Stevens, Mexico, and Orville Hunter, Jr., Columbia, both of Mo., assignors to A. P. Green Industries, Inc., Mexico, Mo.

Filed Jul. 16, 1990, Ser. No. 553,722

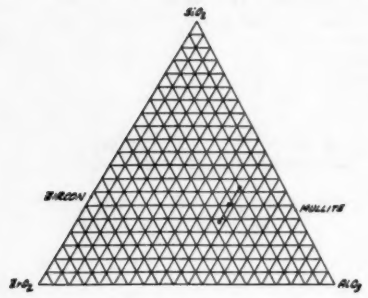
Int. Cl.[5] C03C *13/02, 13/00, 3/062*

U.S. Cl. 501—38 **2 Claims**

1. A refractory glass fiber, said fiber in bulk or blanket form

being substantially cristobalite-free when subjected to temperatures of up to about 2700° F., consisting of, by weight percent:

Al_2O_3 46–49



SiO_2 23–25

ZrO_2 27–29.

5,063,181

SYNTHETIC SILICA GLASS ARTICLE FOR DOPANT-DIFFUSION PROCESS IN SEMICONDUCTORS

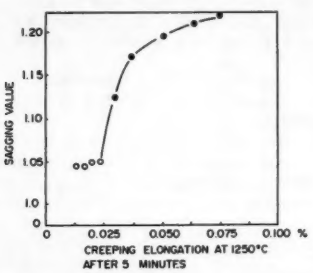
Masatoshi Takita, and Takaaki Shimizu, both of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1989, Ser. No. 427,792

Claims priority, application Japan, Oct. 31, 1988, 63-275297

Int. Cl.[5] C03C *3/06*

U.S. Cl. 501—54 **1 Claim**



1. An article for dopant-diffusion in semiconductors obtained by shaping a block of synthetic silica glass having an elongation after being held under a tension of 62.5 g/mm^2 for five minutes at a temperature of 1250° C. of not greater than 0.025%.

5,063,182

ZIRCONIA-MOLYBDENUM DISILICIDE COMPOSITES

John J. Petrovic, and Richard E. Honnell, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 31, 1990, Ser. No. 575,913

Int. Cl.[5] C04B *35/48, 35/58*

U.S. Cl. 501—96 **3 Claims**

1. A composition of matter consisting essentially of molybdenum disilicide and a material chosen from a group consisting of pure zirconium oxide, partially stabilized zirconium oxide, and fully stabilized zirconium oxide.

5,063,183

SINTERABLE ALUMINUM NITRIDE COMPOSITION, SINTERED BODY FROM THIS COMPOSITION AND PROCESS FOR PRODUCING THE SINTERED BODY

Hitofumi Taniguchi, Chigasaki, and Nobuyuki Kuramoto, Sagamihara, both of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Continuation of Ser. No. 894,256, Aug. 7, 1986, abandoned. This application Aug. 14, 1990, Ser. No. 569,369

Claims priority, application Japan, Aug. 13, 1985, 60-176865; Oct. 30, 1985, 60-241348; Nov. 8, 1985, 60-248797; Nov. 8, 1985, 60-248798

Int. Cl.[5] C04B *35/58*

U.S. Cl. 501—96 **10 Claims**

1. A sintered body of aluminum nitride, said sintered body having a thermal conductivity of at least 200 W/m°K measured at room temperature on a sintered body having a thickness of 6 mm and a high density of at least 3.2 g/cm^3 and consisting essentially of at least 99% by weight of aluminum nitride, at most 0.2% by weight of bound oxygen, at most 0.1% by weight as metal of an oxide of at least one metal element selected from the group consisting of alkaline earth metals, lanthanum group metals and yttrium and at most 0.1% by weight as metal of metal compounds as impurities, wherein the alkaline earth metals are calcium, strontium and barium, and the metal of the metal compounds is silicon, iron, chromium, nickel, cobalt, copper or titanium and said sintered body having a light translucency represented by a coefficient of absorption, determined from its linear transmittance to light having a wavelength of 6 micrometers, of not more than 45 cm^{-1}.

5,063,184

PRESSURELESS SINTERED BODY OF BORON NITRIDE

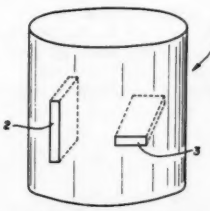
Hagio Tsuycshi; Kazuo Kobayashi, both of Tosu; Hisayoshi Yoshida, Ogoori; Ichitaro Ogawa, Tosu; Hiroshi Harada, Omuta; Hiroaki Yasunaga, Omuta, and Hiroshi Nishikawa, Omuta, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan and Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 294695, Nov. 23, 1988, abandoned. This application Mar. 27, 1990, Ser. No. 501,318

Claims priority, application Japan, Apr. 1, 1987, 62-082097; Aug. 31, 1987, 62-218347

Int. Cl.[5] C04B *35/58*

U.S. Cl. 501—96 **8 Claims**



1. A pressureless sintered body of hexagonal boron nitride consisting essentially of more than 95% weight of boron nitride and not more than 5% of weight of impurities inevitably contained therein containing boron oxide and oxygen, said sintered body or boron nitride having a hexagonal structure, a density ranging between about 1.10 and about 1.80 g/cm^3 and a bending strength of not less than 300 kg/cm^2, and said sintered body being obtained by pulverizing powders of starting feed hexagonal boron nitride so that a specific surface area of each of said powders is at least two times that of the starting feed boron nitride powder,

molding the pulverized powders to obtain a pre-molded body and sintering the pre-molded at a temperature of at least 1400° C. under atmospheric pressure and under a non-oxidative atmosphere.

5,063,185

MODIFIED CERAMIC STRUCTURES AND METHODS OF MAKING THE SAME

Ratnesh K. Dwivedi, Wilmington, and Christopher R. Kennedy, Newark, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 272,514, Nov. 16, 1988, abandoned, which is a continuation of Ser. No. 908,458, Sep. 17, 1986, Pat. No. 4,806,508. This application Jul. 2, 1990, Ser. No. 547,405

Int. Cl.[5] C04B *35/00*

U.S. Cl. 501—126 7 Claims

1. A self-supporting ceramic composite body comprising:

1) an initial ceramic composite body which comprises a polycrystalline oxidation reaction product embedding a substantially inert filler material, said oxidation reaction product selected from the group consisting of alumina, aluminum nitride, aluminum boride, aluminum carbide, silica, silicon nitride, silicon boride, silicon carbide, titania, titanium nitride, titanium boride, titanium carbide, tin oxide, tin nitride, tin boride, tin carbide, zirconia, zirconium nitride, zirconium carbide, hafnia, hafnium nitride, hafnium carbide, and hafnium boride being formed by a directed oxidation reaction of a molten parent metal selected from the group consisting of aluminum, silicon, titanium, tin, zirconium and hafnium, with an oxidant selected from the group consisting of an oxygen containing gas, a nitrogen containing gas, a boron containing element or compound, and a carbon containing element or compound, such that said filler material is embedded by said oxidation reaction product, said initial ceramic composite body having at least some interconnected porosity which is at least partially accessible from at least one surface of said initial ceramic composite body; and

a second ceramic component selected from the group consisting of chromia and silica being disposed in at least a portion of said porosity.

5,063,186

HIGHLY AROMATIC POLYUREA/URETHANE MEMBRANES AND THEIR USE OF THE SEPARATION OF AROMATICS FROM NON-AROMATICS

Robert C. Schucker, Baton Rouge, La., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

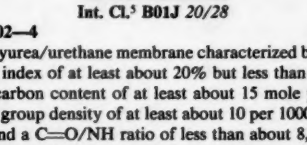
Continuation-in-part of Ser. No. 108,822, Oct. 14, 1987, Pat. No. 4,914,064. This application Apr. 11, 1989, Ser. No. 336,172

The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.

Int. Cl.[5] B01J *20/28*

U.S. Cl. 502—4 12 Claims

1. A polyurea/urethane membrane characterized by possessing a urea index of at least about 20% but less than 100%, an aromatic carbon content of at least about 15 mole percent, a functional group density of at least about 10 per 1000 grams of polymer and a C=O/NH ratio of less than about 8, prepared from a polyurea/urethane copolymer made by reacting a dihydroxy or polyhydroxy compound with an aliphatic, alkylaromatic or aromatic diisocyanate or polyisocyanate and then with a low molecular weight chain extender wherein the dihydroxy or polyhydroxy component is prepared by reacting aliphatic or aromatic dicarboxylic acids with an alkylaromatic dialcohol of the formula



wherein R', R'', and R''' may be the same or different and are selected from the group consisting of H, C_1–C_5 hydrocarbons or C_6H_5 and combinations thereof, and n is 0 to 4.

5,063,187

CATALYST BASED ON CRYSTALLINE ALUMINOSILICATE

Götz Burgfels, Feilenbach-Au; Karl Kochloefl, Bruckmühl; Jürgen Ladebeck, Bad Aibling; Friedrich Schmidt, Rosenheim; Michael Schneider, Ottobrunn/Riemerling, and Hans J. Wernicke, Geretsried, all of Fed. Rep. of Germany, assignors to Sud-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 14, 1989, Ser. No. 436,477

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1988, 3838710

Int. Cl.[5] B01J *29/28*

U.S. Cl. 502—71 19 Claims

1. A catalyst based on crystalline aluminosilicates of the pentasil type, having an Si/Al atomic ratio of at least 10, said catalyst having a structure of primary crystallites of a mean diameter of about 0.1 micron to about 0.9 micron, wherein at least 20 percent of said crystallites are combined into agglomerates of about 5 to about 500 microns in size, the primary crystallites and agglomerates being mutually joined by finely divided alumina obtainable by hydrolysis of aluminum-organic compounds, wherein at least 95 percent (relative to the mean diameter) of the alumina particles being ≦55 microns in size, wherein the BET surface area of the catalyst is about 300 to about 600 m^2/g, wherein the pore volume (determined by mercury porosity) is about 0.3 to about 0.8 cm^3/g and wherein at least 60 percent of the pores have a diameter of about 14 to about 80 nm.

6. In a process for preparing the catalyst of claim 1 by the elevated temperature reaction in an aqueous medium of colloidal silica or alkali metal silicate, aluminum hydroxide or alkali metal aluminate, a source of alkali and a template to form an alkaline aluminosilicate gel with subsequent conversion to a crystalline aluminosilicate, the improvement which comprises:

a) stopping the reaction when the primary crystallites have a mean diameter of about 0.1 to about 0.9 micron;

b) separating the primary crystallites as pre-agglomerates from the aqueous reaction medium;

c) drying the crystallites and subjecting them to an intermediate calcination;

d) reacting the product of step (c) in an aqueous medium a substance containing protons or donating protons on heating;

e) separating and drying the crystallites and subjecting them to intermediate calcination;

f) separating out the agglomerates having a particle size of about 5 to about 500 microns;

g) mixing the separated agglomerates of step (f) with finely divided alumina; and

h) subjecting the product of step (g) to final calcination.

5,063,188

CATALYST COMPONENT FOR ETHYLENE POLYERMIZATION AND COPOLYMERIZATION

Dennis B. Malpass, Peekskill, and Bor-Ping E. Wang, Ossining, both of N.Y., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Apr. 6, 1990, Ser. No. 505,378

Int. Cl.[5] C08F *4/64*

U.S. Cl. 502—116 11 Claims

1. A catalyst component for ethylene polymerization formed by:

(1) reacting an organomagnesium compound with an alkoxy silane to replace organo groups on the organomagnesium compound with alkoxy to yield a product comprising magnesium alkoxide;

(2) contacting the product from step (1) with a chlorinating reagent; and

(3) contacting the product from step (2) with a liquid titanium halide.

5,063,189

RANEY CATALYST COMPOSITION

Peter Jowett, Tame Street, Stalybridge, Cheshire, SK15 1QW, England

Filed Mar. 29, 1990, Ser. No. 500,604

Claims priority, application United Kingdom, Jul. 31, 1987, 8718231

Int. Cl.[5] B01J *25/00*

U.S. Cl. 502—150 16 Claims

1. A method of preparing a Raney metal catalyst composition, which method comprises the step of treating a particulate Raney metal catalyst suspended in water with a fatty monoglyceride having a fatty acid residue of 8 to 24 carbon atoms to coat said Raney metal catalyst particles with said fatty monoglyceride.

5,063,190

ANIONIC INITIATOR SYSTEM FOR POLYMERIZING MONOMERS

I. Glen Hargis, Tallmadge; Hubert J. Fabris, Akron; John A. Wilson, Akron, and Russell A. Livigni, Akron, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

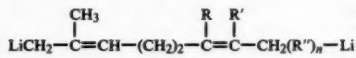
Continuation of Ser. No. 426,929, Oct. 26, 1989, abandoned, which is a division of Ser. No. 200,286, May 31, 1988. This application Jun. 19, 1990, Ser. No. 541,104

Int. Cl.[5] B01J *31/12, 31/14*

U.S. Cl. 502—157 4 Claims

1. An anionic initiator system for polymerizing monomers, comprising:

a blend of an organopolylithium component and a preformed complex component to form a trimetallic initiator, said organopolylithium component having the formula



where

R=H or DH_3,

R′=CH_3 or H with the provisio that R′ is not the same as R,

R″=1,4 and 3,4 isoprene adducts,

n=approximately 4.0,

said preformed complex component made from a trialiphatic substituted aluminum compound and a barium salt of allyl alcohol, the mole ratio of said aluminum metal to said barium metal being from about 3.5 to about 4.5, and the mole ratio of said barium metal to said lithium metal being form about 0.10 to about 0.50.

5,063,191

ALKALI METAL AND ALKALI METAL CARBONATE CATALYTIC SYSTEMS AND CATALYTIC PROCESSES

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 17, 1990, Ser. No. 583,405

Int. Cl.[5] B01J *21/18, 23/02;* C07C *2/24*

U.S. Cl. 502—174 13 Claims

1. A catalytic system which comprises:

a) a catalyst which comprises an elemental alkali metal and a metal oxide wherein the metal is chosen from the lanthanide series; and

b) a catalyst support which comprises an alkali metal carbonate.

5,063,192

CATALYST FOR PURIFICATION OF EXHAUST GASES

Hiroshi Murakami, and Kazuko Yamagata, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 6, 1990, Ser. No. 549,143

Claims priority, application Japan, Jul. 6, 1989, 1-174817

Int. Cl.[5] B01J *21/04, 21/06, 23/02, 23/10*

U.S. Cl. 502—303 9 Claims

1. A catalyst for the purification of exhaust gases consisting essentially of a catalyst carrier with a first coat layer formed on a surface of the catalyst carrier and with a second coat layer formed on a surface of the first coat layer;

wherein the first coat layer consists essentially of an active alumina and a catalyst component comprised of a noble metal and at least one of zirconium oxide, lanthanum oxide and barium oxide is immobilized on particles of the active alumina;

the second coat layer consists essentially of an active alumina, cerium oxide and a catalyst component comprised of another noble metal, wherein a ratio of the weight of the active alumina to cerium oxide ranges from approximately 95 to 5 to approximately 70 to 30; and

wherein said zirconium oxide, lanthanum oxide or barium oxide is contained in an amount ranging from 1% to 10% by weight based on the weight of a total wash coat of the first coat layer and the second coat layer.

5,063,193

BASE METAL AUTOMOTIVE EXHAUST CATALYSTS WITH IMPROVED ACTIVITY AND STABILITY AND METHOD OF MAKING THE CATALYSTS

Raymond E. Bedford, Burton, and William J. LaBarge, Bay City, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1990, Ser. No. 534,584

Int. Cl.[5] B01F *17/00;* B01J *23/10*

U.S. Cl. 502—304 9 Claims

1. A catalyst for the treatment of automobile exhaust gas comprising a support member carrying a catalytically active particulate washcoat layer,

the washcoat consisting essentially of a mixture of finely divided ceric oxide carrier particles and alumina carrier particles, the cerium oxide particles having dispersed thereon copper oxide and optionally a mixture of copper oxide with one or more of chromium oxide, manganese oxide and tin oxide, and the aluminum oxide particles optionally containing one or more of said oxides other than copper oxide,

wherein the proportions of ceric oxide and alumina on the basis of 100 parts by weight of total carrier particles are 20 to 70 parts ceric oxide and 30 to 80 parts alumina, the amount of copper is 1 to 15 parts per 100 parts of carrier particles, the amount of chromium is 0 to 10 parts per 100 parts of carrier particles, and the amount of tin and manganese are respectively 0 to 25 parts per 100 parts of carrier particles.

5,063,194

PALLADIUM CATALYST

Franz J. Broecker, Ludwigshafen; Lothar Arnold, Heidelberg, and Paul Grafen, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 2, 1990, Ser. No. 561,565

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1989, 3926561

Int. Cl.[5] B01J *23/60, 23/62, 23/64*

U.S. Cl. 502—314 8 Claims

1. A palladium catalyst obtained by vapor-depositing metallic palladium on a carrier, treating the palladium coating with

a metallic inhibitor by vapor deposition, and heating the product at from 300 to 800° C.

5,063,195

HIGH EFFICIENCY SILVER CATALYST FOR THE PRODUCTION OF ETHYLENE OXIDE VIA ETHYLENE OXIDATION

JiQuan Jin, Beijing; Lian Di Shang, Tianjin; Guo Quan Jin; Yong Xu, both of Beijing, and Guo Chun Luo, Tianjin, all of China, assignors to China Petrochemical Corporation, Beijing, China and Beijing China Research Institute of Beijing Yanshan Petrochemical Corporation, Beijing, China

Filed Feb. 1, 1989, Ser. No. 304,531

Claims priority, application China, Feb. 3, 1988, 88100400.6

Int. Cl.[5] B01J *21/04, 23/02, 23/50*

U.S. Cl. 502—341 **21 Claims**

1. A process for preparing a silver-containing catalyst for the production of ethylene oxide via ethylene oxidation, comprising:

preparing a mixture of commercial trihydrated α-alumina, boehmite alumina, carbonaceous material, a fluxing agent, a fluoride, a binder and water;

extruding the mixture to form a shaped body;

drying and calcining the shaped body to convert it into an alumina carrier having the following pore structure:

Specific surface area	0.2–2 m^2/g
pore volume	>0.5 ml/g
pore radius	10–25% of the total volume being greater than 30μ

impregnating the alumina carrier with a solution of a silver compound and an alkali or alkaline earth metal compound; and

reducing and activating said silver impregnated carrier.

5,063,196

CHROMIUM-FREE IMPREGNATED ACTIVATED CARBON FOR ADSORPTION OF TOXIC GASES AND/OR VAPORS

David T. Doughty, Coraopolis, and James E. Groose, Mt. Lebanon, both of Pa., assignors to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Jun. 23, 1989, Ser. No. 371,430

Int. Cl.[5] B01J *20/22, 20/20, 31/28;* **B01D** *53/04*

U.S. Cl. 502—417 **9 Claims**

1. An impregnated activated carbon adsorbent impregnated with at least one solution so as to provide a composition of, by total elemental weight including said activated carbon, from about 4 to 14% copper and 2 to 12% zinc, from 0 to 10% silver and from about 1.5 to 6% triethylenediamine.

5,063,197

HEAT-SENSITIVE RECORDING MATERIAL

Atsuo Goto; Fumio Okumura, both of Tsukuba, and Kazuhiko Ito, Tsuchiura, all of Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

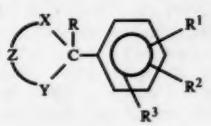
Filed Sep. 4, 1990, Ser. No. 576,969

Claims priority, application Japan, Sep. 4, 1989, 1-230084; Sep. 29, 1989, 1-254618; Nov. 17, 1989, 1-299072; Feb. 9, 1990, 2-30556; Feb. 9, 1990, 2-30557; Mar. 27, 1990, 2-79643; May 7, 1990, 2-118242; May 7, 1990, 2-118243

Int. Cl.[5] B41M *5/30*

U.S. Cl. 503—209 **17 Claims**

1. A heat-sensitive recording material comprising a support and a heat-sensitive recording layer provided on the support, said heat-sensitive recording layer comprising an electron-donating, colorless or pale-colored dye precursor, an electron-accepting developer which reacts with the dye precursor to form images upon heating, a binder, and an aromatic compound represented by the following structural formula:



wherein

X and Y are oxygen atoms or sulfur atoms and may or may not be identical with each other,

Z is alkylene group which has two or more carbon atoms and may have a side chain,

R is hydrogen atom or alkyl group,

R^1, R^2 and R^3 are independently

hydrogen atoms;

alkoxy groups;

alkylthio groups;

phenyl groups;

aryloxy groups which may have a substituent;

—$COOR^4$ groups wherein R^4 is alkyl group or aralkyl or aryl group which may have a substituent; or

—OZ^1X^1—Ar^1 groups wherein Z^1 is alkylene or alkenylene group which may have a substituent, X^1 is oxygen atom, sulfur atom or single bond, and Ar^1 is aryl group which may have a substituent;

and wherein

all of R^1, R^2 and R^3 are not hydrogen atoms and two of R^1, R^2 and R^3 may be linked with each other to form a cyclic structure.

5,063,198

DYE TRANSFER TYPE THERMAL PRINTING SHEETS

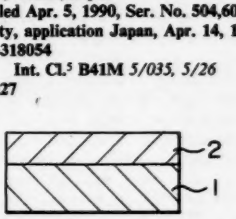
Akihiro Imai, Ikoma; Tetsuji Kawakami; Hiromu Matsuda, both of Katano; Keiichi Yubakami, Suita, and Nobuyoshi Taguchi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 5, 1990, Ser. No. 504,606

Claims priority, application Japan, Apr. 14, 1989, 1-095762; Dec. 7, 1989, 1-318054

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **15 Claims**



1. A dye transfer thermal printing sheet comprising

(a) a substrate, and

(b) a lamina comprising

a dye and

either a cured product of a moisture curable resin or a reaction-cured product of a moisture curable resin and a reactive silicone oil,

on at least one side of the substrate.

5,063,199

METHOD OF DEPOSITING THIN FILMS OF HIGH TEMPERATURE BI-SR-CA-CU-O-BASED CERAMIC OXIDE SUPERCONDUCTORS

Kenton D. Budd, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 15, 1990, Ser. No. 538,835

Int. Cl.[5] B05D *5/12, 3/02*

U.S. Cl. 505—1 **24 Claims**

1. A method comprising the steps of

(a) preparing a liquid precursor of a Bi-Sr-Ca-Cu-O-based ceramic oxide superconductor phase, wherein said liquid

precursor comprises an alkoxyalkanol, copper acrylate, strontium acrylate, bismuth nitrate, and calcium nitrate, wherein said liquid precursor has a cation ratio sufficient to form the desired stoichiometry in said ceramic oxide superconductor phase when said liquid precursor is heated to a temperature and for a time sufficient to provide said desired ceramic oxide superconductor phase, and wherein said copper acrylate, strontium acrylate, bismuth nitrate, and calcium nitrate are mutually soluble in said alkoxyalkanol;

(b) applying said liquid precursor to a substrate, wherein said substrate is one of an oxide ceramic, a metal selected from the group consisting of Ag and Ni, and Si; and

(c) heating said substrate in an oxygen-containing atmosphere with said liquid precursor applied thereon to a temperature and for a time sufficient to form a thin film comprising at least one Bi-Sr-Ca-Cu-O-based high temperature ceramic oxide superconductor phase.

5,063,200

CERAMIC SUPERCONDUCTOR ARTICLE

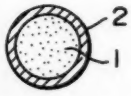
Michiya Okada, Mito; Tadaoki Morimoto, Ibaraki; Akira Okayama, Hitachi; Yoshimi Yanai, Hitachi; Hiroshi Satoh, Hitachi; Toshimi Matsumoto, Katsuta; Yoshiteru Chiba, Hitachi; Kimihiko Akahori, Katsuta; Takahiko Kato, Hitachi; Toshiya Doi, Hitachi, and Kazuhide Tanaka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 230,053

Claims priority, application Japan, Aug. 12, 1987, 62-199819; Dec. 11, 1987, 62-311982

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 **24 Claims**



1. A shaped superconductor article, which comprises:

a shaped high Tc ceramic oxide superconductor shaped in a form of one of a wire, a tape and a disk;

a metal sheath surrounding said shaped oxide superconductor and comprising a lowermost layer adjacent said shaped oxide superconductor and at least one upper layer adjacent said lowermost layer; and

an oxygen impermeable conductive oxide film made of aluminum oxide formed at an interface between said lowermost layer and said at least one upper layer so as to prevent diffusion of oxygen from said shaped oxide superconductor to said at least one upper layer.

5,063,201

METHOD TO PRODUCE $YBA_2CU_3O_{6+x}$ SUPERCONDUCTING WIRES OR TAPES

A. Srinivasa Rao, Arnold, and Om P. Arora, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1990, Ser. No. 599,605

Int. Cl.[5] H01L *39/12*

U.S. Cl. 505—1 **3 Claims**

1. A method for making an improved ceramic superconductor $YBa_2Cu_3O_{6+x}$ comprising:

a) mixing a yttrium oxide with barium carbonate and copper oxide in the ratio of about 50 to about 100 gm of Y_2O_3, about 175 to about 200 gm of $BaCO_3$ and about 105 to about 300 gm of CuO

b) ball milling the mixture with zirconia balls for at least one hour;

c) calcining the mixture at 940° C. + or −2° C. with a heating sequence of about 3° C. to about 5° C. per minute;

d) maintaining the temperature at 940° C. + or −2° C. for about 300 to about 600 minutes to ensure complete reaction of the mixture;

e) cooling the mixture to room temperature at the rate of about 3° C. to about 5° per minute;

f) grinding the mixture into a fine size powder using zirconia balls,

g) heating the powder to about 700° C. at the rate of about 5° C. per minute and cooling the mixture to 550°–600° C. for 300 minutes in a flowing oxygen environment;

h) annealing the mixture at 550°–600° C. for 300 minutes in a flowing oxygen environment;

i) cooling the mixture to room temperature at the rate of about 1° C. per minute;

j) adding pure aluminum powder to the fine $YBa_2Cu_3O_{6+x}$ in the ratio 60 gm of Al to 40 gm of $YBa_2Cu_3O_{6+x}$;

k) ball milling the mixture for about one hour using zirconia balls;

l) dry pressing the powder mixture at about 25,000 psi;

m) heating the powder mixture at from about 375°–400° C. for about 1 hour;

n) cooling the powder mixture, and

o) rolling the powder mixture into a thin ceramic superconductor.

5,063,202

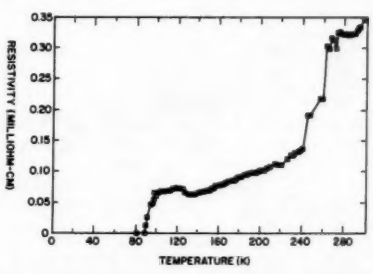
HIGH TRANSITION TEMPERATURE SUPERCONDUCTORS

Jagdish Narayan, Raleigh, N.C., assignor to Kopin Corporation, Taunton, Mass.

Continuation of Ser. No. 85,591, Aug. 14, 1987, abandoned. This application Apr. 27, 1990, Ser. No. 517,523

Int. Cl.[5] H01L *39/12*; C01F *17/00*; C01G *3/02*

U.S. Cl. 505—1 **3 Claims**



1. The compound $YBa_2Cu_4O_{10}$ wherein is such that said compound has a perovskite-like unit cell structure of approximately the following dimensions a=3.8Å, b=3.9Å, and c=13.55Å.

5,063,203

METHOD OF PREVENTING OR TREATING THROMBOSIS USING KAPPA-CASEINOGLYCOPEPTIDE AS ACTIVE INGREDIENT

Ludovic O. Drouet, Paris; Claire Bal Dit Sollier, Vincennes; Elisobeth M. Mazoyer, Paris; Sylviane Levy Toledano, Paris; Pierre Jolles, Paris, and Ann-Taiic D. Fiat, Le Vesinet, all of France, assignors to Centre National de la Recherche Scientifique (CNRS) and Institut des Vaisseaux et da Sang (IVS), both of Paris, France

Filed May 9, 1990, Ser. No. 520,760

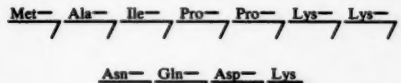
Claims priority, application France, May 11, 1989, 89 06207

Int. Cl.[5] A61K *37/02*; C07K *15/10, 15/14*

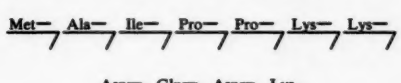
U.S. Cl. 514—8 **13 Claims**

1. A method of preventing or treating thrombosis in human beings, comprising the step of administering an effective antithrombotic amount of a κ-caseinoglycopeptide selected from the group consisting of:

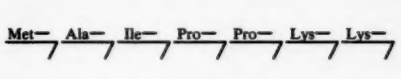
κ-caseinoglycopeptide from cow's milk having the following composition in terms of residues/mole: 5 Asp; 12 Thr; 6 Ser; 10 Glu; 8 Pro; 1 Gly; 5 Ala; 6 Val; 1 Met; 6 Ile; 1 Leu; 3 Lys; and the following N-terminal sequence:



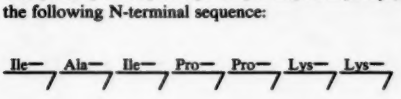
κ-caseinoglycopeptide from ewe's milk having the following composition in terms of residues/mole: 7 Asp; 10 Thr; 7 Ser; 9 Glu; 7 Pro; 10 Ala; 6 Val; 1 Met; 5 Ile; 3 Lys; 1 His; and the following N-terminal sequence:



κ-caseinoglycopeptide from goat's milk having the following composition in terms of residues/mole: 7 Asp; 11 Thr; 8 Ser; 9 Glu; 6 Pro; 9 Ala; 5 Val; 1 Met; 6 Ile; 3 Lys; 1 His; and the following N-terminal sequence:



κ-caseinoglycopeptide from human milk having the following composition in terms of residues/mole: 3 Asp; 14 Thr; 4 Ser; 6 Glu; 11 Pro; 7 Ala; 6 Val; 10 Ile; 1 Phe; 3 Lys; and the following N-terminal sequence:



5,063,204

PROCESS FOR TREATING INFERTILITY

Howard S. Jacobs, London, England, assignor to Nordisk Gentofte A/S, Gentofte, Denmark

Continuation of Ser. No. 64,846, Jun. 19, 1987, abandoned. This application Mar. 2, 1990, Ser. No. 488,490

Claims priority, application Denmark, Jan. 30, 1987, 499/87

Int. Cl.[5] A61K *37/24, 37/36, 37/38*

U.S. Cl. 514—8 **12 Claims**

1. In a process for treating infertility caused by abnormal gonadotrophin secretion in mature higher female mammals wherein said mammals are injected with gonadotrophins to stimulate ovarian function, the improvement comprising administering growth hormone to said mammals in combination with said gonadotrophins, said growth hormone being administered in an amount effective to enhance said stimulation of the ovarian function in said mammals.

5,063,205

UPTAKE OF IRON BY THE BODY

Timothy J. Peters, London, and Kishor B. Raja, North Harrow, both of England, assignors to National Research Development Corporation, London, England

Filed Dec. 8, 1987, Ser. No. 130,594

Claims priority, application United Kingdom, Jun. 5, 1987, 8713169

Int. Cl.[5] A61K *37/02, 37/36*

U.S. Cl. 514—12 **7 Claims**

1. A method for the enhancement of iron uptake or the treatment of iron deficiency in a subject in need thereof which comprises administering to said subject amounts which together are therapeutically effective of epidermal growth factor (EGF) and an iron providing material.

5,063,206

COMPOSITIONS HAVING USE AS TREATMENT OF NEUROPSYCHIATRIC DEFICITS

Peter Bridge, Washington, D.C., and Frederick K. Goodwin, Chevy Chase, Md., assignors to The United States of Americas as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 285,559, Dec. 16, 1988, which is a continuation-in-part of Ser. No. 199,873, May 27, 1988, abandoned. This application May 16, 1989, Ser. No. 352,313

Int. Cl.[5] A61K *37/02; C07K 7/08*

U.S. Cl. 514—16 **11 Claims**

1. A method of treating mental disorders not caused by HIV infection which comprises administration of a thymoleptic effective amount of (1) a linear peptide of the formula:

$$R^a\text{—Ser—Thr—Thr—Thr—Asn—Tyr—}R^b \quad \text{(I)}$$

wherein R^a represents an amino terminal residue which is

Ala—,D—Ala, or Cys—Ala—,

R^b represents a carboxy terminal Thr-, Thr-amide, Thr-Cys or Thr-Cys-amide, and derivatives thereof which are esters and amides; (2) a thymoleptic effective amount of a linear peptide formula:

$$R^1\text{—}R^2\text{—}R^3\text{—}R^4\text{—}R^5 \quad \text{(II)}$$

wherein

R^1 is an amino terminal residue which is X-R′ or R′ wherein R′ is Thr—,Ser—,Asn—,Leu,Ile—,Arg— or Glu— and X is Cys;

R^2 Thr, Ser, or Asp;

R^3 is Thr, Ser, Asn, Arg, Gln, Lys or Trp;

R^4 is Tyr; and

R^5 is a carboxy terminal residue which is R″X or R″ wherein R″ may be any amino acid and X is Cys; or (3) a thymoleptic effective amount of a linear peptide of the formula:

$$R^{1\prime}\text{—}R^2\text{—}R^3\text{—}R^4\text{—}R^{5\prime} \quad \text{(III)}$$

wherein

$R^{1\prime}$ is an amino terminal residue Ala-R′, D-Ala-R′ or X—Ala—R′, R′, R^2, R^3, R^4 and X are defined as above, and $R^{5\prime}$ is a carboxy terminal residue Thr, thr amide or Thr-Cys; and ester and amide derivatives thereof or the physiologically acceptable salts thereof.

5,063,207

RENIN INHIBITORS, METHOD FOR USING THEM, AND COMPOSITIONS CONTAINING THEM

Annette M. Doherty, Ann Arbor; Harriet W. Hamilton, Chelsea; John C. Hodges, Ann Arbor; Joseph T. Repine, and Ila Sircar, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 206,023, Jun. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 113,772, Oct. 26, 1987, abandoned. This application Jul. 24, 1989, Ser. No. 384,236

Int. Cl.[5] A61K *37/02*; C07K *5/08, 5/10*

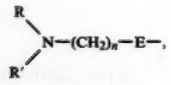
U.S. Cl. 514—18 13 Claims

1. A peptide of the formula

A—X—Y—W—U I

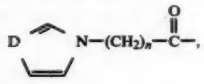
or a pharmaceutically acceptable acid addition salt thereof wherein

A is



Z′ N—$(CH_2)_n$—E—,

or



wherein

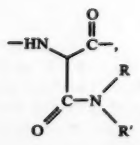
R and R′ are each independently hydrogen, benzyl or lower alkyl;

Z′ N—

is a saturated ring of from 1 to 5 carbon atoms wherein Z′ is CH_2, O, S, or NR, n is an integer of from 0 to 3; and D is N, S, or O;

X is PHE, HOMOPHE, TYR, TYR(OMe), CYCLOHEXYLALA, LEU, NAPHTHYLALA, TRP, HIS, or (NMe)PHE;

Y is GLN, HIS, LEU, PGY, MET, MET(O), MET(O_2), TZ, ALG, PPG, CPM, EMG, BYG, NIA, PHA,



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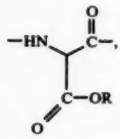

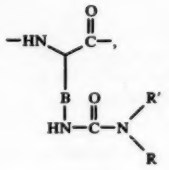

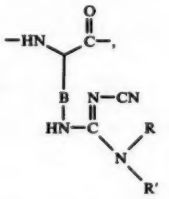

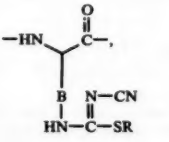

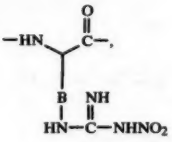

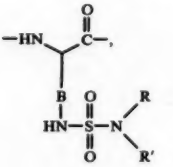

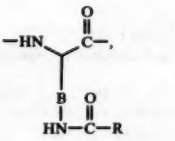

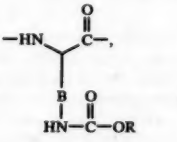

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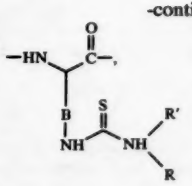
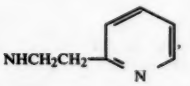


wherein B is a carbon chain of from 3 to 6 carbon atoms which is saturated, unsaturated, or acetylenic;

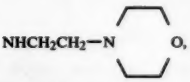
R and R' are each independently hydrogen benzyl or lower alkyl;

W is STA, CYSTA, PHSTA, CHSTA, ASTA, ACYS, DFSTA, DFKSTA, DFCYS, DFKCYS, DFCHS, DFKCHS; and

U is



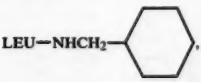
$NHCH_2CH_2N(CH_2CH_2OH)_2$,

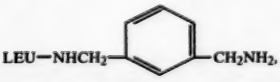


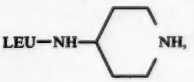
$NHCH_2CH(CH_3)CH_2CH_3$,

$NHCH(CH_2OH)CH(CH_3)CH_2CH_3$,

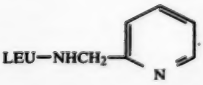
LEU—$NHCH_2Ph$,







or



5,063,208

PEPTIDYL AMINODIOL RENIN INHIBITORS

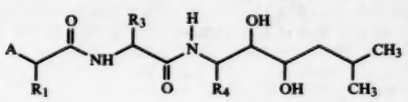
Saul H. Rosenberg, Libertyville; Kenneth P. Spina, Chicago, and Steven R. Crowley, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 7,385,836, Jul. 26, 1989, abandoned. This application Jun. 29, 1990, Ser. No. 544,072

Int. Cl.[5] A61K *37/02*; C07K *5/08*

U.S. Cl. 514—19 10 Claims

1. A compound of the formula:



wherein

A is R_{13}—Q—B—wherein R_{13} is (heterocyclic)amino, (heterocyclic)aminoalkyl, (heterocyclic)(alkyl)amino, (heterocyclic)(alkyl)aminoalkyl, ((heterocyclic)alkyl-)amino, ((heterocyclic)alkyl)aminoalkyl, ((heterocyclic-)alkyl)(alkyl)amino or ((heterocyclic)alkyl)(alkyl-)aminoalkyl; Q is —C(O)—or $—S(O)_2—$; and B is —NH—, —N(loweralkyl)—, —S—, —O—, $—CH_2—$or —CH(OH)—;

R_1 is loweralkyl, cycloalkylalkyl, arylalkyl, aryloxyalkyl, thioaryloxyalkyl, arylaminoalkyl, aryloxy, thioaryloxy or arylamino;

R_3 is loweralkyl, alkenyl, alkoxyalkyl, thioalkoxyalkyl, ((alkoxy)alkoxy)alkyl, arylalkyl or (heterocyclic)alkyl; and

R_4 is loweralkyl, cycloalkylalkyl or arylalkyl; or a pharmaceutically acceptable salt, ester or prodrug thereof.

5,063,209

MODULATION OF AIDS VIRUS-RELATED EVENTS BY DOUBLE-STRANDED RNAS

William A. Carter, Birchrunville, Pa., assignor to HEM Research, Inc., Rockville, Md.

Continuation of Ser. No. 433,445, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 124,572, Nov. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 900,614, Aug. 26, 1986, Pat. No. 4,795,744, which is a continuation-in-part of Ser. No. 886,363, Jul. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 769,494, Aug. 25, 1985, abandoned. This application Aug. 10, 1990, Ser. No. 565,174

The portion of the term of this patent subsequent to Jan. 2, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/70, 37/00*

U.S. Cl. 514—44 20 Claims

1. A method of treating retrovirus or T-cell lymphotropic virus-induced conditions including AIDS in a person infected with same comprising administering to that person an amount of dsRNA sufficient to therapeutically benefit AIDS-related disorders.

5,063,210

USE OF SULFATED POLYSACCHARIDES TO DECREASE CHOLESTEROL AND FATTY ACID ABSORPTION

Louis G. Lange, III, 38 Kingsbury Place, St. Louis, Mo. 63112, and Curtis A. Spilburg, 2230 Willow Ridge La., Chesterfield, Mo. 63017

Continuation-in-part of Ser. No. 340,868, Apr. 20, 1989. This application Oct. 31, 1989, Ser. No. 429,398

Int. Cl.[5] A61K *31/715*; C12N *9/16*

U.S. Cl. 514—54 4 Claims

1. A method for inhibiting human pancreatic cholesterol esterase comprising contacting the human pancreatic cholesterol esterase with an effective inhibiting amount of a 3-sulfate

polysaccharide having a molecular weight greater than 10,000 Daltons.

5,063,211

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND (N,N-DIMETHYL-N'-PHENYL-N'-FLUOROCHLOROMETHYLTHIO)-SULPHAMIDE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,955
Int. Cl.[5] A01N *41/02, 57/00*
U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride and (b) (N,N-dimethyl-N:-phenyl-N'-fluorodichloromethylthio).sulphamide wherein the weight ratio of (a):(b) is from about 11:1 to 1:3.6.

5,063,212

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND B-BROMO-B-NITROSTYRENE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,950
Int. Cl.[5] A01N *33/18, 57/00*
U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride and (b) B-bromo-B-nitrostyrene wherein the weight ratio of (a):(b) is from about 20:1 to 1:1.

5,063,213

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND BROMOCHLOROHYDANTOIN

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,951
Int. Cl.[5] A01N *43/50, 57/00*
U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride and (b) bromochlorohydantoin wherein the weight ratio of (a):(b) is from about 10:1 to 1:1.9.

5,063,214

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND SODIUM HYPOCHLORITE

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,956
Int. Cl.[5] A01N *57/00, 59/08*
U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride (TPC) and (b) sodium hypochlorite wherein the weight ratio of (a):(b) is from about 16:1 to 1.6:1.

5,063,215

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND 3,5-D-THIADIAZINE THIONE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,952
Int. Cl.[5] A01N *43/86, 43/88, 57/00*
U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride (TPC) and (b) 3,5-D-thiadiazine thione wherein the weight ratio of (a):(b) is from about 1:1 to 1:21.

5,063,216

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND BIS(TRIBUTYL) TIN OXIDE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,954
Int. Cl.[5] A01N *55/04, 57/00*
U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride and (b) bis(tributyl) tin oxide wherein the weight ratio of (a):(b) is from about 84:1 to 1:4.

5,063,217

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND A MIXTURE OF 5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE AND 2-METHYL-4-ISOTHIOZOLIN-3-ONF

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,957
Int. Cl.[5] A01N *43/80, 57/00*
U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride and (b) a mixture of about 75% 5-chloro-2-methyl-4-isothiazolin-3-one and about 25% 2-methyl-4-isothiazol-3-one wherein the weight ratio of (a):(b) is from about 40:1 to 0.5:1.

5,063,218

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF N-TRIBUTYL TETRADECYL PHOSPHONIUM CHLORIDE AND TRICHLORO-S-TRIAZINE TRIONE

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 13, 1990, Ser. No. 566,953
Int. Cl.[5] A01N *43/66, 57/00*
U.S. Cl. 514—75 **7 Claims**

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) n-tributyl tetradecyl phosphonium chloride and (b) trichloro-s-triazine trione wherein the weight ratio of (a):(b) is from about 10.5:1 to 1:1.

5,063,219

ANTICOCCIDIAL COMPOSITION

Eugene G. Schildknecht, Hacketts Town, and Govind G. Untawale, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 217,488, Jul. 11, 1988, Pat. No. 4,996,198. This application Oct. 9, 1990, Ser. No. 594,887
Int. Cl.[5] A61K *31/35, 31/505, 31/635*
U.S. Cl. 514—157 4 Claims

1. A composition for combatting coccidiosis in animals, which comprises sulfadimethoxine, ormetoprim, and salinomycin, wherein these ingredients are present in amounts which in combination are synergistically effective in combatting at least one coccidiosis-causing strain of Eimeria.

5,063,220

PARENTERAL FORMULATIONS OF 1-DIPHENYLMETHYL-4-((2-(4-METHYLPHENYL)-5-METHYL-1H-IMIDAZOL-4-YL)METHYL)PIPERAZINE

Alastair B. Selkirk, Edinburgh, and Michael J. Dey, West Lothian, both of Scotland, assignors to Syntex Pharmaceuticals, Ltd., Maidenhead, England

Division of Ser. No. 260,628, Oct. 21, 1988, Pat. No. 4,973,591. This application Sep. 20, 1990, Ser. No. 585,436
Int. Cl.[5] A61K *31/62, 31/495*
U.S. Cl. 514—161 9 Claims

1. A pharmaceutical formulation suitable for parenteral administration, comprising: 1-diphenylmethyl-4-[(2-(4-methylphenyl)-5-methyl-1H-imidazol-4-yl)methyl]piperazine, tartaric acid, a tonicifier, water, and a therapeutically effective amount of a second active agent, said second active agent being active in reducing the risk of stroke.

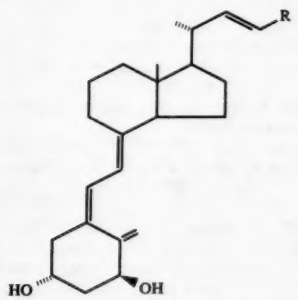
5,063,221

TREATMENT FOR HYPERPARATHYROIDISM WITH USE OF VITAMIN D DERIVATIVES

Yasuho Nishii, Tokyo, and Yumiko Takita, Mitaka, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,226
Claims priority, application Japan, Apr. 5, 1989, 1-87380
Int. Cl.[5] A01N *45/00;* C07J *172/00, 175/00*
U.S. Cl. 514—167 11 Claims

1. A method for treating hyperparathyroidism comprising administering to a patient suffering from hyperparathyroidism an effective amount of a 1α-hydroxyvitamin D derivative of formula (I):



(I)

wherein R is a branched alkyl group having 4–6 carbon atoms that is substituted by one or two hydroxyl groups or a cyclopropylhydroxymethyl group.

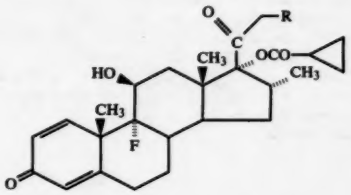
5,063,222

ANTIINFLAMMATORY DEXAMETHASONE 17α-CYCLOPROPANECARBOXYLATES WITH REDUCED SYSTEMIC ACTIVITY

Teruo Komoto, Chiba; Junji Okawa, Narita; Yoichiro Ogawa, Chiba; Susumu Sato, Shisui; Naokata Taido, Funabashi, and Tadayuki Kuraishi, Chiba, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1990, Ser. No. 508,686
Claims priority, application Japan, Apr. 19, 1989, 1-99762
Int. Cl.[5] A61K *31/56*
U.S. Cl. 514—180 2 Claims

1. A steroid derivative represented by formula (I),



(I)

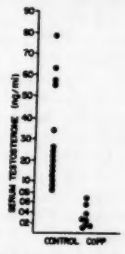
wherein R is a hydrogen atom, a halogen atom, a hydroxy group, or a group —$OCOR_1$, wherein R_1 is a linear or branched alkyl group which may be substituted by a halogen atom or a cycloalkyl group, a cycloalkyl group, or an aryl group.

5,063,223

METHOD OF CONTROLLING ANDROSTENE LEVELS IN VIVO WITH COBALT PORPHYRINS

Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Division of Ser. No. 310,855, Feb. 14, 1989, Pat. No. 4,948,792, which is a continuation-in-part of Ser. No. 105,591, Nov. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 927,830, Nov. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 832,512, Feb. 21, 1986, abandoned, which is a continuation of Ser. No. 708,228, Mar. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 363,588, Mar. 8, 1982, abandoned. This application Mar. 23, 1990, Ser. No. 498,289
Int. Cl.[5] A61K *31/40*
U.S. Cl. 514—185 3 Claims



1. A method of limiting the production of androgenic steroidal hormones in animals in need of such limitation which comprises parenteral administration of from 5 to 50 um/kg b.w. of cobalt protoporphyrin or cobalt mesoporphyrin.

5,063,224

R-CEFUROXIME AXETIL

Gerold L. Mosher, and Michael V. Mullen, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 9, 1990, Ser. No. 550,005
Int. Cl.[5] C07D *501/34;* A61K *31/545*
U.S. Cl. 514—202 **8 Claims**

1. Substantially pure R-cefuroxime axetil.

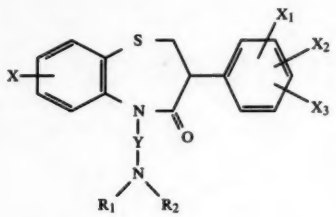
5,063,225

BENZOTHIAZEPINES

Francois Clemence; Daniel Fréchet, both of Paris; Gilles Hamon, Le Raincy, and Simone Jouquey, Paris, all of France, assignors to Roussel Uclaf, Paris, France

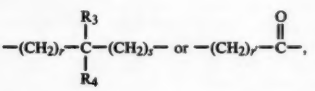
Filed Apr. 11, 1990, Ser. No. 508,127
Claims priority, application France, Apr. 13, 1989, 89 04905
Int. Cl.[5] C07D *281/10, 417/06;* A61K *31/55*
U.S. Cl. 514—211 **25 Claims**

1. A compound selected from the group consisting of all possible isomeric forms, racemic or optically active of a compound of the formula



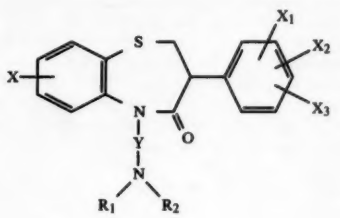
I

wherein X is selected from the group consisting of hydrogen, halogen, —OH, alkyl and alkoxy of 1 to 3 carbon atoms, $—NO_2$, $—NH_2$, $—CF_3$ and alkylamino and dialkylamino of 1 to 4 alkyl carbon atoms, X_1, X_2 and X_3 are individually selected from the group consisting of hydrogen, halogen, —OH, alkyl and alkoxy of 1 to 3 carbon atoms, $—NO_2$, $—CF_3$, $—SCF_3$, $—OCF_3$, $—NH_2$ and alkylamino and dialkylamino of 1 to 4 alkyl carbon atoms, Y is



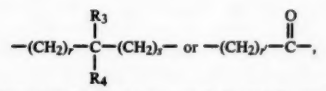
r and s are integers from 0 to 4 with r+s=1 to 4, R_3 and R_4 are individually hydrogen or alkyl of 1 to 4 carbon atoms, r' is an integer from 1 to 4, R_1 and R_2 are individually selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms unsubstituted or substituted with aryl of 6 to 12 carbon atoms optionally substituted with 1 to 3 members of the group consisting of alkyl and alkoxy of 1 to 4 carbon atoms, —OH, —CN, halogen, $—NH_2$ and alkylamino and dialkylamino of 1 to 4 alkyl carbon atoms or R_1 and R_2 together with the nitrogen to which they are attached form a member selected from the group consisting of pyrrolidinyl, imidazolidinyl, pyrazolidinyl, piperidyl, piperazinyl or morpholinyl, all optionally substituted on a carbon of the heterocycle or on the nitrogen atom when the heterocycle contains a second nitrogen atom by alkyl of 1 to 4 carbon atoms or by aryl or arylalkyl of 6 to 12 carbon atoms optionally substituted with 1, 2 or 3 members of the group consisting of halogen and alkyl or alkoxy of 1 to 4 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts, with the proviso that at least one of X, X_1, X_2 and X_3 is selected from the group consisting of —OH, $—NH_2$, alkylamino and dialkylamino of 1 to 4 alkyl carbon atoms or at least one of X_1, X_2 and X_3 is selected from the group consisting of $—SCF_3$ or $—OCF_3$.

15. A method of treating arhythmia in warm-blooded animals comprises administering to warm-blooded animals an anti-arhythmically effective amount of at least one compound selected from the group consisting of all possible isomeric forms, racemic or optically active of a compound of the formula



I

wherein X is selected from the group consisting of hydrogen, halogen, —OH, alkyl and alkoxy of 1 to 3 carbon atoms, $—NO_2$, $—NH_2$, $—CF_3$ and alkylamino and dialkylamino of 1 to 4 alkyl carbon atoms, X_1, X_2 and X_3 are individually selected from the group consisting of hydrogen, halogen, —OH, alkyl and alkoxy of 1 to 3 carbon atoms, $—NO_2$, $—CF_3$, $—SCF_3$, $—OCF_3$, $—NH_2$ and alkylamino and dialkylamino of 1 to 4 alkyl carbon atoms, Y is



integers from 0 to 4 with r+s=1 to 4, R_3 and R_4 are individually hydrogen or alkyl of 1 to 4 carbon atoms, r' is an integer from 1 to 4, R_1 and R_2 are individually selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms unsubstituted or substituted with aryl of 6 to 12 carbon atoms optionally substituted with 1 to 3 members of the group consisting of alkyl and alkoxy of 1 to 4 carbon atoms, —OH, —CN, halogen, $—NH_2$ and alkylamino and dialkylamino of 1 to 4 alkyl carbon atoms or R_1 and R_2 together with the nitrogen to which they are attached form a member selected from the group consisting of pyrrolidinyl, imidazolidinyl, pyrazolidinyl, piperidyl, piperazinyl or morpholinyl, all optionally substituted on a carbon of the heterocycle or on the nitrogen atom when the heterocycle contains a second nitrogen atom by alkyl of 1 to 4 carbon atoms or by aryl or arylalkyl of 6 to 12 carbon atoms optionally substituted with 1, 2 or 3 members of the group consisting of halogen and alkyl or alkoxy of 1 to 4 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

5,063,226

USE OF SUPPLEMENTAL DIETARY RIBOFLAVIN TO INCREASE FERTILITY AND/OR PROLIFICACY IN ANIMALS

Fuller W. Bazer, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 220,037, Jul. 15, 1988, abandoned. This application Mar. 29, 1990, Ser. No. 503,065
Int. Cl.[5] A61K *31/525*
U.S. Cl. 514—251 **4 Claims**

1. A method for increasing the pregnancy rate and litter size in swine, said method comprising the administration of enhanced levels of riboflavin to a swine during a period which commences on about day 4 of the gestation period of said swine and ends on about day 10 of said gestation period; wherein the dosage of said riboflavin is at least about 100 mg/day and is sufficient to increase the concentration of riboflavin in uterine secretions of said swine by at least about 10%.

5,063,227

QUINAZOLINE-SUBSTITUTED PYRIDAZINONE DERIVATIVES HAVING CARDIOTONIC ACTIVITY

Yuji Nomoto; Haruki Takai; Tetsuji Ohno, and Kazuhiro Kubo, all of Shizuoka, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

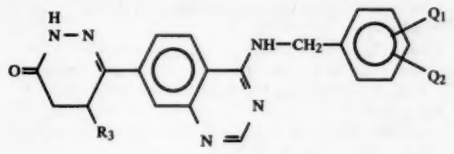
Continuation of Ser. No. 297,440, Jan. 17, 1989, abandoned. This application Jan. 11, 1990, Ser. No. 462,914

Claims priority, application Japan, Jan. 23, 1988, 63-13301

Int. Cl.[5] C07D *403/02;* A61K *31/50*

U.S. Cl. 514—252 3 Claims

1. A compound of the formula:



wherein R_3 is hydrogen or C_{1-6} alkyl; and Q_1 and Q_2 are independently hydrogen, C_{1-4} alkyl, hydroxyl, C_{1-4} alkoxyl, amino, mono- or di-C_{1-4} alkyl-substituted amino, nitro or halogen; or a pharmaceutically acceptable acid addition salt thereof.

5,063,228

4-(SUBSTITUTEDAMINOETHYL)-3,4-DIHYDRO-2-ALKYLPYRIMIDO08 1,6-A09 BENZIMIDAZOL-1(2H)-ONES AS ANTIARRHYTHMIC AGENTS

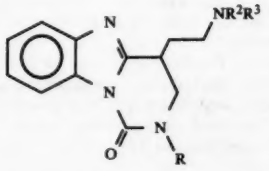
Albert D. Cale, Jr., Mechanicsville, and Thomas W. Gero, Richmond, both of Va., assignors to A. H. Robbins Company, Incorporated, Richmond, Va.

Filed May 31, 1990, Ser. No. 531,137

Int. Cl.[5] A61K *31/495, 31/505;* C07D *487/06*

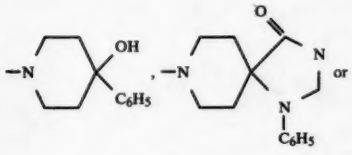
U.S. Cl. 574—253 15 Claims

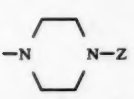
1. An antiarrhythmic compound having the formula:



where R^1 is loweralkyl;

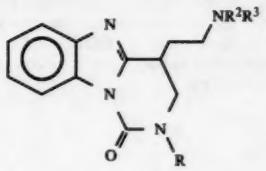
R^2 and R^3 are independently selected from H, loweralkyl, phenyl or phenyl substituted by 1 or 2 substituents selected from the group consisting of halogen, hydroxy, loweralkoxy, or loweralkylcarbonyl or $—NR^2R^3$ forms a heterocyclic group selected from the group consisting of imidazole, morpholine,





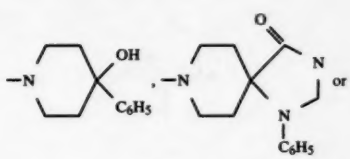
where Z is loweralkyl, phenyl or phenyl substituted by 1 or 2 substituents selected from the group consisting of halogen, hydroxy, loweralkoxy, or loweralkylcarbonyl, 2-pyridinyl or 2-pyrimidinyl; an optical isomer or a pharmaceutically acceptable salt thereof.

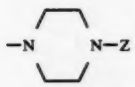
14. A method for treating cardiac arrhythmias in a warm blooded animal which comprises administering thereto a therapeutically effective amount for treating cardiac arrhythmias of a compound having the formula:



where R^1 is loweralkyl;

R^2 and R^3 are independently selected from H, loweralkyl, phenyl or phenyl substituted by 1 or 2 substituents selected from the group consisting of halogen, hydroxy, loweralkoxy, or loweralkylcarbonyl or $—NR^2R^3$ forms a heterocyclic group selected from the group consisting of imidazole, morpholine,





where Z is loweralkyl, phenyl or phenyl substituted by 1 or 2 substituents selected from the group consisting of halogen, hydroxy, loweralkoxy, or loweralkylcarbonyl, 2-pyridinyl or 2-pyrimidinyl; an optical isomer or a pharmaceutically acceptable salt thereof.

5,063,229

IMIDAZOLO [1,2-A]PYRIMIDINES AND MEDICAL USE THEREOF

Dankwart C. Fenske, Weybridge; Elizabeth A. Kuo, Swindon, and Wilfred R. Tully, Cirencester, all of Great Britain, assignors to Roussel Ulcaf, Paris, France

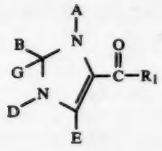
Division of Ser. No. 271,732, Nov. 15, 1988, Pat. No. 4,895,866, which is a division of Ser. No. 80,407, Jul. 31, 1987, Pat. No. 4,810,828. This application Nov. 9, 1989, Ser. No. 435,078

Claims priority, application United Kingdom, Aug. 28, 1986, 8620060

Int. Cl.[5] C07D *471/04;* A61K *31/415*

U.S. Cl. 514—258 12 Claims

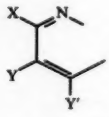
1. A compound selected from the group consisting of compound of the formula



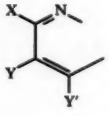
I

wherein R_1 is selected from the group consisting of

and —C≡C—R′, R is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R′ is selected from the group consisting of hydrogen, alkyl and hydroxyalkyl of 1 to 5 carbon atoms, and aryl of 6 to 10 carbon atoms unsubstituted or substituted with at least one member of the group consisting of halogen, —OH, —COOH, —CF_3 and alkyl and alkoxy of 1 to 5 carbon atoms, A and B together form a bond, G and D together form



wherein X is alkyl or alkylthio of 1 to 5 carbon atoms, Y and Y′ are individually hydrogen or alkyl of 1 to 5 carbon atoms and E is hydrogen or halogen with the proviso when A and B are a bond and G and D together are



and R_1 is

E is other than hydrogen or a non-toxic, pharmaceutically acceptable acid addition salt.

7. A method of relieving inflammation in warm-blooded animals comprising administering to warm-blooded animals an anti-inflammatorily effective amount of at least one compound of claim 1.

5,063,230

SUBSTITUTED SATURATED AND UNSATURATED INDOLE QUINOLINE AND BENZAZEPINE CARBOXAMIDES AND THEIR USE AS PHARMACOLOGICAL AGENTS

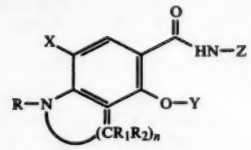
Jeffrey C. Pelletier, Lansdale, Pa.; Raymond D. Youssefyeh, Princeton Junction, N.J., and Henry F. Campbell, North Wales, Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Ft. Washington, Pa.

Division of Ser. No. 277,582, Nov. 29, 1988, Pat. No. 4,920,219. This application Apr. 6, 1990, Ser. No. 489,646

Int. Cl.[5] A61K *31/46, 31/435*

U.S. Cl. 514—213 **2 Claims**

1. A method for the treatment of a patient suffering from gastrointestinal disorders comprising administering thereto a gastrointestinal effective amount of a compound according to the formula



wherein

X is hydrogen, hydroxy, amino, mono- and di-loweralkylamino, halo, trifluoromethyl, sulfamyl, mono- and di-loweralkylsulfamyl or loweralkylsulfonyl;

R is hydrogen or loweralkyl;

R_1 and R_2 are independently hydrogen or loweralkyl;

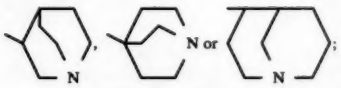
vicinal R_2 groups together may be $—(CH_2)_a—$ where a is 1 to 4, thus forming a 3 to 6 member ring;

n is 2 to 4;

Y is loweralkyl, $—(CR_1R_2)_b—$SO-loweralkyl or $—(CR_1R_2)_b—$CO-loweralkyl;

b and d are 1 to 3; and

Z is $—(CR_1R_2)_d—NR_1R_2$,



or a pharmaceutically acceptable salt thereof.

5,063,231

METHOD OF TREATMENT OF VISCERAL PAIN

Gareth J. Sanger, and Helen E. Marr, both of Harlow, England, assignors to Beecham Group p.l.c., Harlow, England

Division of Ser. No. 348,051, May 2, 1989, Pat. No. 4,942,160, which is a division of Ser. No. 145,537, Jan. 19, 1988, Pat. No. 4,845,092. This application May 7, 1990, Ser. No. 520,108

Int. Cl.[5] A61K *31/55, 31/44, 31/40*

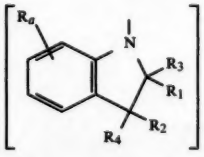
U.S. Cl. 514—214 **2 Claims**

1. A method of treatment of visceral pain in mammals, including humans, which method comprises the administration to the mammal in need of such treatment, a visceral pain relieving effective amount of a compound of formula (I) or a pharmaceutically acceptable salt thereof:

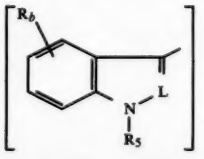
X—CO—Y—Z (I)

wherein

X is a group of formula (d) or (e):

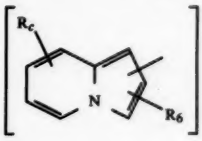


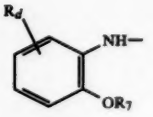
(a)

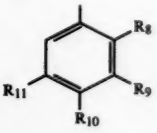


(b)

-continued







wherein

R_d is selected from hydrogen, halogen or hydroxy;

R_7 is independently hydrogen or C_{1-6} alkyl;

either R_8 is C_{1-6} alkoxy;

R_9 is hydrogen;

R_{10} is amino or C_{1-7} alkanoylamino; and

R_{11} is halo or C_{1-6} alkylthio; or

R_8 is hydrogen;

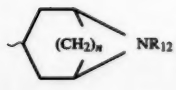
R_9 is halo C_{1-6} alkoxy or C_{1-6} alkyl;

R_{10} is hydrogen or C_{1-6} alkoxy; and

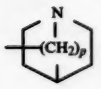
R_{11} is halo, C_{1-6} alkoxy or C_{1-6} alkyl;

Y is NH or O, with the proviso that Y is NH when X is (e) and R_8 is C_{1-6} alkoxy;

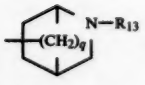
Z is a group of formula (f), (g) or (h):



(f)



(g)



(h)

wherein

n is 2 or 3;

p and q are independently 1 to 3; and

R_{12} or P_{13} is methyl or ethyl.

5,063,232

2-TERT-BUTYL-4-CHLORO-5-(4-TERT-BUTYLBENZYL-THIO)-3(2H)-PYRIDAZINONE FOR COTROLLING SNAILS AND SLUGS

Joachim Leyendecker, Ladenburg; Christoph Kuenast, Otterstadt, and Peter Hofmeister, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

(c) **Division of Ser. No. 377,945, Jul. 11, 1989, Pat. No. 4,981,851. This application Jul. 6, 1990, Ser. No. 549,064**

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824211

The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.

Int. Cl.[5] A01N *43/58*

U.S. Cl. 514—247 **4 Claims**

(d) 1. A snail or slug bait which contains a molluscicidally effective amount of 2-tert-butyl-4-chloro-5-(4-tert-butyl-benzylthio)-3(2H)-pyridazinone and an edible bait capable of attracting molluscs;

wherein said edible bait is selected from the group consisting of ground cereals, wheat flour, shredded wheat, shredded barley, coarse soybean flour, bran, rice, starch, fish meal, meat meal, and molasses.

(e)

5,063,233

N_9-CYCLOPENTYL-SUBSTITUTED ADENINE DERIVATIVES USEFUL AS ADENOSINE RECEPTOR AGONISTS

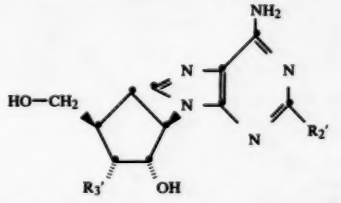
Jen Chen, Middlesex, and Alan J. Hutchison, Verona, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 193,969, May 13, 1988, Pat. No. 4,954,504, which is a continuation-in-part of Ser. No. 137,554, Dec. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 931,327, Nov. 14, 1986, abandoned. This application May 31, 1990, Ser. No. 531,499

Int. Cl.[5] A61K *31/52*; C07D *473/18, 473/34, 473/16*

U.S. Cl. 514—266 **12 Claims**

1. A compound of the formula



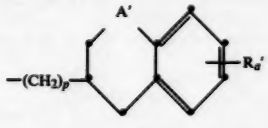
(Ia)

wherein R_2' represents $NR_b'—R_1'$ or NHR_1'; R_1' represents

(f) cyclohexenyl-lower alkyl, C_3–C_6-cycloalkyl, 4-tetrahydropyranyl, 4-tetrahydrothiopyranyl, 4-tetrahydropyranyl-lower alkyl, 4-tetrahydrothiopyranyl-lower alkyl, admantyl-lower alkyl, C_3–C_6-cycloalkyl-lower alkyl, aryl or aryl-lower alkyl in which aryl represents thienyl, pyridyl, phenyl or

(g) phenyl substituted by one to three of halogen, trifluoromethyl, lower alkoxy, lower alkyl or by a substituent —W—Z in which W represents a direct bond, lower alkylene or oxy-lower alkylene, and Z represents hydroxy, cyano, carboxy, lower alkoxycarbonyl, carbamoyl, N-mono- or N,N-di-lower alkylcarbamoyl; or R_1' represents a substituent of the formula B'

(h)



(B')

in which A' represents a direct bond, methylene, oxy or thio, p represents zero, one or two, and R_a' represents hydrogen, lower alkyl, lower alkoxy or halogen; R_3' represents hydrogen or hydroxy; R_b' represents lower alkyl; a pharmaceutically acceptable prodrug ester derivative thereof in which one or more free hydroxy groups are esterified in for of a pharmaceutically acceptable ester; or a pharmaceutically acceptable salt thereof.

9. A pharmaceutical composition having adenosine-2-receptor stimulating activity suitable for administration to a mammal comprising an effective amount of a compound of claim 1 in combination with one or more pharmaceutically acceptable carriers.

11. A method of treating cardiovascular conditions responsive to adenosine-2 receptor stimulation in mammals comprising the administration to a mammal in need thereof of an effective adenosine-2 receptor stimulating amount of a compound of claim 1 or of a pharmaceutical composition comprising a said compound.

5,063,234

METHOD OF INHIBITING DEMINERALIZATION OF BONE

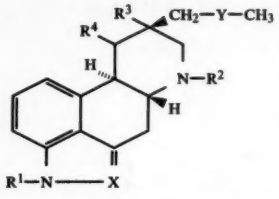
Henry U. Bryant, and James A. Clemens, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 529,031, May 25, 1990, abandoned. This application Apr. 11, 1991, Ser. No. 684,524

Int. Cl.[5] **A61K** *31/48, 31/415;* **C07D** *457/02*

U.S. Cl. 514—288 **7 Claims**

1. A method of inhibiting bone demineralization comprising administering to a mammal in need of treatment an effective amount of a compound having the formula



I

where

X is CH or N;

Y is O or S;

R^1 is 2-propenyl, C_1–C_3 alkyl, benzyl or substituted benzyl where the substitutents are one or two of the same or different and are selected from methyl, ethyl, methoxy, ethoxy, hydroxy, chloro, bromo, or fluoro;

R^2 is C_2–C_3 alkyl, allyl or cyclopropylmethyl;

R^3 and R^4 are both hydrogen or combine to form a carbon-carbon bond; and pharmaceutically acceptable acid addition salts thereof.

5,063,235

4-[(DIARYL)HYDROXYMETHYL]-1-PIPERIDINEALKANOLS AND ESTERS AND CARBAMATES THEREOF USEFUL IN THE TREATMENT OF ALLERGIC DISORDERS

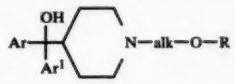
David A. Walsh, Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Filed Apr. 30, 1990, Ser. No. 516,570

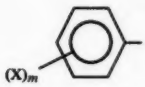
Int. Cl.[5] **A61K** *31/445;* **C07D** *211/22*

U.S. Cl. 514—317 **6 Claims**

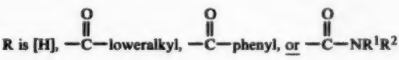
1. A compound having the formula:



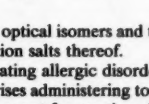
wherein Ar and Ar^1 can be independently phenyl, 2, 3 or 4-pyridinyl, or



where X is selected from halogen, trifluoromethyl, loweralkyl, loweralkoxy, or hydroxy and m is 0–3, "alk" is a straight or branched hydrocarbon chain containing 2–12 carbons;

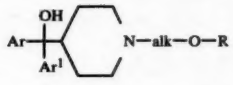


where R^1 and R^2 are independently selected from H, loweralkyl, phenyl, or

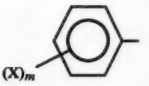


as defined above; the optical isomers and the pharmaceutically acceptable acid addition salts thereof.

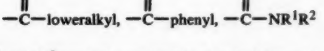
3. A method of treating allergic disorders in warm blooded animals which comprises administering to said animals a therapeutically effective amount for treating allergic disorders of a compound having the formula:



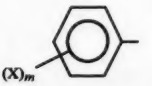
wherein Ar and Ar^1 can be independently phenyl, 2, 3 or 4-pyridinyl, or



where X is selected from halogen, trifluoromethyl, loweralkyl, loweralkoxy, or hydroxy and m is 0–3, "alk" is a straight or branched hydrocarbon chain containing 2–12 carbons;



where R^1 and R^2 are independently selected from H, loweralkyl, phenyl, or



as defined above; the optical isomers and the pharmaceutically acceptable acid addition salts thereof.

5,063,236

PYRIDYL SUBSTITUTED GUANIDINES USEFUL AS INSECTICIDES

Laurenz Gsell, Basle, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

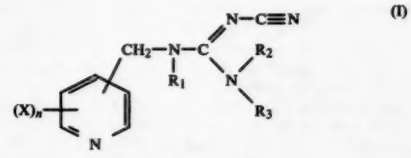
Continuation of Ser. No. 396,587, Aug. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 226,357, Jul. 29, 1988, abandoned. This application Jun. 18, 1990, Ser. No. 539,297

Claims priority, application Switzerland, Aug. 4, 1987, 2985/87; Jun. 6, 1988, 2141/88

Int. Cl.[5] C07D *277/20*

U.S. Cl. 514—318 8 Claims

7. A method of controlling insects and representatives of the order Acarina which comprises bringing into contact or treating said pests, or various stages of development thereof or the locus thereof, with a pesticidally effective amount of a compound of formula I and tautomers thereof



(I)

in which each of R_1 and R_3, independently of the other, is hydrogen or C_1–C_4alkyl; R_2 is hydrogen, C_1–C_4alkyl, benzyl or picolyl; or R_2 and R_3 are together a —$(CH_2)_4$— or —$(CH_2)_5$—radical; X is halogen; and n is an integer 0, 1, 2 or 3; or a salt of a compound of formula I; with the exception of N-picolyl-N-methyl-N′-cyanoguanidine and N-picolyl-N′-methyl-N″-cyanoguanidine; or with a composition containing a pesticidally effective amount of said compound together with a carrier or other adjuvant.

5,063,237

1,4-DIHYDRO-2-(4-[BENZIMIDAZOL-L-YL]PHENYL)-PYRIDINES AS PLATELET ACTIVATING FACTOR ANTAGONISTS

Kelvin Cooper; Michael J. Fray; Kenneth Richardson, and John Steele, all of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

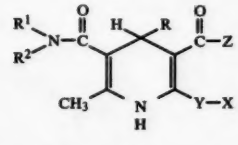
Division of Ser. No. 251,413, Sep. 29, 1988, Pat. No. 4,935,430. This application May 1, 1990, Ser. No. 517,116

Claims priority, application United Kingdom, Sep. 30, 1987, 8722977; Feb. 25, 1988, 8804441

Int. Cl.[5] C07D *401/10;* A61K *31/415*

U.S. Cl. 514—338 7 Claims

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt, wherein R is phenyl, chlorophenyl, trifluoromethoxyphenyl, difluorophenyl, cyanophenyl, fluorophenyl, or methylenedioxyphenyl; R^1 is pyridyl; R^2 is hydrogen or alkyl having one to four carbon atoms; Z is alkoxy having one to six carbon atoms or chlorobenzyloxy; Y is 1,4-phenylene; and X is benzimidazol-1-yl or 2-methylbenzimidazol-1-yl.

4. A method of treating an allergic condition in a mammal which comprises administering to said mammal an anti-allergic effective amount of a compound according to claim 1.

5,063,238

PREVENTION OF GLYCOPROTEIN ENVELOPED VIRUS INFECTIVITY BY PYRIDINYLOXAZOLE-2-ONES

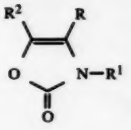
Sai P. Sunkara, and Winton D. Jones, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 436,264, Nov. 13, 1989, abandoned. This application Oct. 3, 1990, Ser. No. 590,522

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—340 10 Claims

1. A method of treating an enveloped viral infection in a patient in need thereof which comprises administering to the patient an anti-enveloped virally effective amount of a compound of the formula



(I)

wherein

R and R_1 are each independently selected from the group consisting of hydrogen, C_1–C_6 alkyl, and phenyl or C_1–C_3 alkylphenyl wherein the phenyl ring is optionally substituted with one, two or three of the substituents selected from the group consisting of fluorine, chlorine, bromine, C_1–C_4 alkyl, and C_1–C_4 alkoxy; and

R_2 is a 2-, 3-, or 4-pyridyl group wherein the pyridyl group is optionally substituted with one or two substituents selected from the group consisting of fluorine, chlorine, bromine, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, cyano, carboxy, carb(C_1–C_5)alkoxy, carbamido, (C_1–C_5)alkanoylamino, imidazolyl, nitro and trifluoromethyl or wherein the pyridyl group is optionally substituted with a phenyl group which is optionally substituted with one, two or three of the substituents selected from the group consisting of fluorine, chlorine, bromine, C_1–C_4 alkyl, and C_1–C_4 alkoxy; or a pharmaceutically-acceptable salt thereof.

5,063,239

AMINO-ESTERS OF DIHYDROPYRIDINES USEFUL FOR IMPROVING CIRCULATION IN PATIENTS

Eckhard Schwenner, Wuppertal; Hartmut Stegelmeier, Hilden; Stanislav Kazda, Wuppertal, and Andreas Knorr, Erkrath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

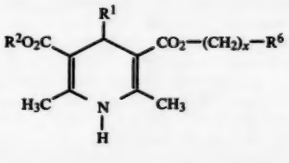
Division of Ser. No. 317,313, Mar. 1, 1989, Pat. No. 4,950,676, which is a division of Ser. No. 18,652, Feb. 25, 1987, Pat. No. 4,861,782. This application May 8, 1990, Ser. No. 520,419

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607821

Int. Cl.[5] C07D *211/78;* A61K *31/44*

U.S. Cl. 514—357 4 Claims

1. An aminoalkyl ester of a dihydropyridinedicarboxylic acid of the formula



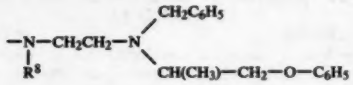
in which

R^1 is phenyl, the phenyl ring being optionally substituted by 1 or 2 identical or different substituents from the group consisting of chlorine, trifluoromethyl, nitro and cyano,

R^2 is a straight-chain or branched hydrocarbon radical which has up to 7 carbon atoms and is optionally interrupted in the chain by an oxygen atom and said hydrocarbon radical is optionally substituted by fluorine and cyano,

X is a number from 2 to 6, and

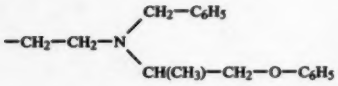
R^6 represents a radical of the formula



wherein

R^7 represents hydrogen or methoxy and

R^8 represents hydrogen, or represents straight-chain or branched C_1–C_6-alkyl, or represents the group of the formula



or a physiologically acceptable salt thereof.

4. A method of improving the circulation of a patient in need thereof which comprises administering to such patient a circulation-active effective amount of a compound or salt according to claim 2.

5,063,240

NOVEL COMPOUNDS

Richard M. Hindley, Epsom, England, assignor to Beecham Group p.l.c., Brentford, United Kingdom

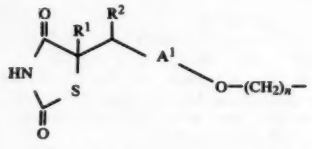
Filed May 7, 1990, Ser. No. 521,157

Claims priority, application United Kingdom, May 9, 1989, 8910639

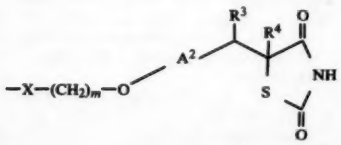
Int. Cl.[5] C07D *417/12*; A61K *31/425*

U.S. Cl. 514—369 **10 Claims**

1. A compound of formula (I):



(I)



or a tautomeric form thereof and/or a pharmaceutically acceptable salt thereof and/or a pharmaceutically acceptable solvate thereof, characterized in that:

R^1 represents hydrogen or C_{1-12} alkyl and R^2 represents hydrogen or R^1 and R^2 together represent a bond;

R^3 represents hydrogen and R^4 represents hydrogen or C_{1-12} alkyl or R^3 and R^4 together represent a bond;

X represents a bond, >C=O, >CHOH, O, S or NR wherein R is a C_{1-12} alkyl group;

n represents an integer 1, 2 or 3;

m represents an integer 1, 2 or 3 and

A^1 and A^2 each independently represent a benzene ring having in total up to 5 substituents comprising up to 3 optional substituents selected from halogen, substituted or unsubstituted C_{1-12} alkyl or C_{1-12} alkoxy; and wherein optional substituents for the C_{1-12} alkyl group are up to five, groups selected from halogen, C_{1-12} alkyl, phenyl, C_{1-12} alkoxy, halo-C_{1-12}-alkyl, hydroxy, amino, nitro, carboxy, C_{1-12} alkoxycarbonyl, C_{1-12} alkoxycarbonyl-C_{1-12}-alkyl, C_{1-12} alkylcarbonyloxy, or C_{1-12} alkylcarbonyl groups.

5,063,241

FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Gerd Hänssler, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Graham Holmwood, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

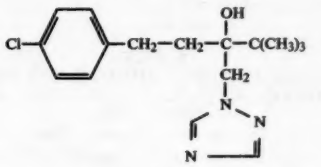
Division of Ser. No. 439,896, Nov. 20, 1989, Pat. No. 4,970,223, which is a continuation of Ser. No. 801,549, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 646,591, Aug. 31, 1984, abandoned. This application Aug. 14, 1990, Ser. No. 567,472

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333411

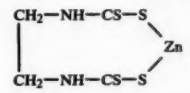
Int. Cl.[5] A01N *43/64, 47/10*

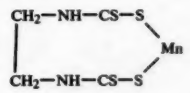
U.S. Cl. 514—383 **2 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of

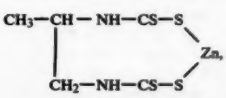


or an addition product thereof with a metal or salt, and (ii) at least one member selected from the group consisting of





and



wherein the weight ratio of (i):(ii) is about 1:1.

5,063,242

7-((SUBSTITUTED)AMINO)-8-((SUBSTITUTED)CARBONYL)-METHYLAMINO)-1-OXASPIRO(4,5)DECNAES AS DIURETICS ANTIINFLAMMATORY, AND CEREBROVASCULAR AGENTS

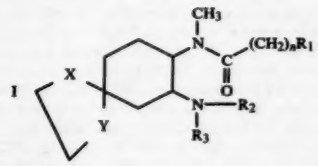
David C. Horwell, Foxton, and David C. Rees, Cambridge, both of England, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 341,336, Apr. 21, 1989, Pat. No. 4,965,278. This application Jul. 11, 1990, Ser. No. 551,583

Int. Cl.[5] A01N *43/38*

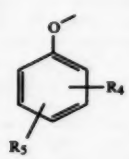
U.S. Cl. 514—414 **3 Claims**

1. A method for treating inflammation which comprises administering to a patient in need of said treatment a therapeutically effective amount of a compound in unit dosage form of formula



or a pharmaceutically acceptable salt thereof, wherein n is an integer of from one to six; either of X or Y is oxygen and the other is —CH_2—; R is selected from

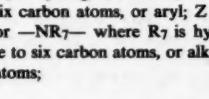
a)



where R_4 and R_5 are independently hydrogen, fluorine, chlorine, bromine, nitro, trifluoromethyl, alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, or aryl;

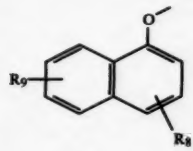
b) 3,4,5-trimethylphenoxy;

c)



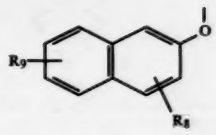
where R_6 is hydrogen, fluorine, chlorine, alkyl of from one to six carbon atoms, or aryl; Z is —CH_2—, —O—, —S—, or —NR_7— where R_7 is hydrogen, alkanoyl of from one to six carbon atoms, or alkyl of from one to six carbon atoms;

d)

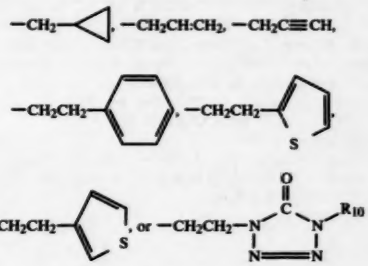


wherein R_8 and R_9 are independently hydrogen, fluorine, bromine, alkyl of from one to six carbon atoms, or alkoxy of from one to four carbon atoms; or

e)



where R_8 and R_9 are as defined above; where R_2 is methyl and R_3 is hydrogen, alkyl of from one to six carbon atoms,



where R_{10} is alkyl of from one to four carbon atoms; or where R_2 and R_3 when taken together with the nitrogen atom to which they are attached, form a pyrrolidinyl, piperidinyl, or hexahydro-1H-azepinyl ring.

5,063,243

DERIVATIVE OF CAFFEIC ACID AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Hidetsura Cho, Osaka; Masaru Ueda, Saitama; Mie Tamaoka, Nara; Mikiko Hamaguchi, Hyogo; Seiitsu Murota, and Ikuo Morita, both of Tokyo, all of Japan, assignors to Suntory, Ltd., Osaka, Japan

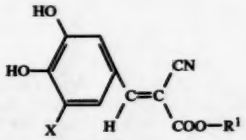
Filed Apr. 28, 1989, Ser. No. 344,583

Claims priority, application Japan, Apr. 28, 1988, 63-106274; Mar. 8, 1989, 1-55867

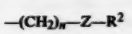
Int. Cl.[5] A61K *31/275, 31/38*; C07C *255/34*; C07D *333/22*

U.S. Cl. 514—438 **5 Claims**

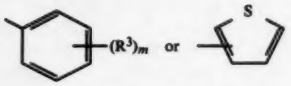
1. A caffeic acid derivative of the general formula (I) and pharmaceutically permissible salts thereof:



wherein X is a hydrogen atom or hydroxy group; R' is a straight or branched chain alkyl or an alkenyl group wherein said alkyl or alkenyl groups contain up to 20 carbon atoms or a group of the formula:



wherein n is an integer of 1 to 10; Z is an oxygen atom, a vinylene residue or a single bond, and R^2 is selected from



wherein R^3 is selected from hydroxy groups, lower alkoxy groups and halogens and m is an integer from 0 to 3.

5,063,244

PROCESS FOR THE ISOLATION OF ANTIFUNGAL AGENT (5-METHOXY-7-HYDROXYFLAVAN) FROM DRAGON'S BLOOD RESIN AND ITS USE IN AGRICULTURE

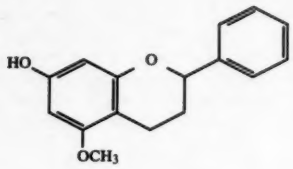
Ming-Ju Chang; Yuan-Hsun Hsu; Mei-Hui Kuo, and Tai-Sen Soong, all of Taipei, Taiwan, assignors to Development Center for Biotechnology, Taiwan, Taiwan

Filed Jul. 30, 1990, Ser. No. 559,079

Int. Cl.[5] A01N *43/16*

U.S. Cl. 514—456 **2 Claims**

1. A method of preventing the infection of fungi in plants, said method comprising applying a fungicidally effective amount of the compound



to the plants or the locus of the plants.

5,063,245

CORTICOTROPIN-RELEASING FACTOR ANTAGONISM COMPOUNDS

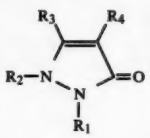
Mary E. Abreu, Baltimore; Waclaw Rzeszotarski, Millersville; Donald J. Kyle, Baltimore; Roger N. Hiner, Baltimore, and Richard L. Elliott, Baltimore, all of Md., assignors to Nova Pharmaceutical Corporation, Baltimore, Md.

Filed Mar. 28, 1990, Ser. No. 500,478

Int. Cl.[5] A61K *31/415*; C07D *231/22*

U.S. Cl. 514—404 **8 Claims**

1. A corticotropoin-releasing factor antagonist represented by the Formula I:



(I)

wherein:

R_1 is hydrogen; phenyl; phenyl singly or multiply substituted with halogen, nitro, amino, alkylamino, dialkylamino, dialkylaminomethyl, C_{1-3}alkyl (straight chain, branched, saturated or unsaturated), hydroxy, alkoxy, cyano, trifluoromethyl, alkylthio, alkylsulfonyl, or methylenedioxy; naphthyl; indanyl; indenyl; C_{1-4}alkyl (straight chain, branched, saturated or unsaturated); or aralkyl (where the aryl group is selected from phenyl or naphthyl and the alkyl group is C_{1-3});

R_2 is C_{1-4}alkyl (straight chain, branched, saturated or unsaturated); phenyl; or aralkyl (where the aryl group is selected from those set forth in the definition of R_1 and the alkyl is C_{1-3});

R_3 is C_{1-8} alkyl (straight chain, branched, saturated or unsaturated); C_{1-8} straight chain alkyl substituted with at least one carboxylic acid, amino or carboxymethoxy group; phenyl; or phenyl singly or multiply substituted with acetimido, amino, nitro, alkylamino, dialkylaminomethyl, hydroxy, alkoxy, alkylsulfonyl, methylenedioxy, halogen or trifluoromethyl;

R_4 is SCO-C_{1-4}alkyl, or pharmaceutically acceptable salt thereof.

5,063,246

PHENETHYLAMINE DERIVATIVE COMPOSITIONS AND USE

Kazuo Imai; Kunihiro Niigata; Takashi Fujikura, all of Saitama; Shinichi Hashimoto, Matsudo; Toichi Takenaka, Tokyo, and Kazuo Honda, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 364,579, Jun. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 253,368, Sep. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 24,605, Mar. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 894,464, Jul. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 690,398, Jan. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 517,734, Jul. 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 285,782, Jul. 22, 1981, abandoned. This application Aug. 21, 1990, Ser. No. 569,780

Claims priority, application Japan, Jul. 29, 1980, 55-104175; Jun. 15, 1981, 56-92010

Int. Cl.[5] A61K *31/255, 31/135*

U.S. Cl. 514—517 **5 Claims**

1. A pharmaceutical composition useful for producing an antihypertensive action based solely on an alpha-adrenergic action, said composition comprised of a therapeutically effective amount of alpha-{[2-(2-methoxyphenoxy)ethylamino]methyl}-4-methyl-3-methylsulfinylbenzenemethanol or its salt and a pharmaceutically acceptable excipient or diluent therefor.

2. A method of producing an antihypertensive action based solely upon an alpha-adrenergic action by administering a therapeutically effective amount of a pharmaceutical composition comprised of a member selected from the group consisting of α-{[2-(2-methoxyphenoxy)ethylamino]methyl}-4-methyl-3-methoxysulfinylbenzenemethanol, α-{[2-(methoxyphenoxy)ethylamino]-methyl}-4-methyl-3-methylsulfinylbenzenemethanol and 4-{2-[2-(ethoxyphenoxy)ethylamino]-2-methylethyl}-2-(methylthio)anisole, and a pharmaceutically acceptable carrier.

5,063,247

DIPHENYLUREA DERIVATIVES

Tetsuo Sekiya, Yokohama; Shinya Inoue, Tokyo; Masao Taniguchi, Machida; Kohei Umezu, Yokohama, and Kazuo Suzuki, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

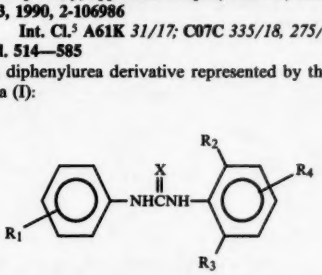
Filed Jun. 13, 1990, Ser. No. 537,302

Claims priority, application Japan, Jun. 15, 1989, 1-152594; Apr. 23, 1990, 2-106986

Int. Cl.[5] A61K *31/17*; C07C *335/18, 275/34*

U.S. Cl. 514—585 **5 Claims**

1. A diphenylurea derivative represented by the following formula (I):



(I)

wherein R_1 is an alkyl group of 5 to 18 carbon atoms, each of

R_2 and R_3 is independently an alkyl group of 1 to 5 carbon atoms, an alkoxy group of 1 to 5 carbon atoms or a halogen atom, R_4 is hydrogen atom, an alkyl group of 1 to 5 carbon atoms, an alkoxy group of 1 to 5 carbon atoms or a halogen atom, and X is oxygen atom or sulfur atom.

5. A pharmaceutical composition for treating hyperlipemia and atherosclerosis comprising a therapeutically effective amount of a diphenylurea derivative as defined in claim 1, in admixture with a pharmaceutically acceptable carrier, diluent, or a mixture thereof.

5,063,248

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF GLUTARALDEHYDE AND 2-(DECYLTHIO) ETHANAMINE

John T. Conlan, Ventura, Calif., and Wilson K. Whitekettle, Conroe, Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 566,637, Aug. 13, 1990, Pat. No. 5,008,023. This application Oct. 12, 1990, Ser. No. 597,258

Int. Cl.[5] A01N *33/08, 35/00*

U.S. Cl. 514—665 2 Claims

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) glutaraldehyde and (b) 2-(decylthio) ethanamine wherein the weight ratio of (a):(b) is from about 285:1 to 1.11:1.

5,063,249

NONIRRITATING TEAT DIP AND METHOD

Jeffrey F. Andrews, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 878,573, Jun. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 760,241, Jul. 29, 1985, abandoned. This application Oct. 23, 1989, Ser. No. 426,501

Int. Cl.[5] A61K *31/13*

U.S. Cl. 514—673 19 Claims

1. A germicidal animal teat dip concentrate comprising, as a substantially stable homogeneous mixture, a germicide selected from the group consisting of 3-(n-dodecylamino)propylamine, a pharmaceutically acceptable acid-addition salt of 3-(n-dodecylamino)-propylamine, 2-[2-(n-dodecylamino)ethylamino]ethylamine, and a pharmaceutically acceptable acid-addition salt of 2-[2-(n-dodecylamino)ethylamino]ethylamine; as an emollient a polyethylene glycol methyl glucoside; a film-forming ingredient; and water, wherein the total amount of all germicide or germicides present in said concentrate is about 0.25 to 2.5 percent based on the total weight of said teat dip concentrate.

5,063,250

PROCESS FOR THE PRODUCTION OF METHANOL

Katsutoshi Murayama, Niigata, and Hideaki Nagai, Tokyo, both of Japan, assignors to Mitsubishi Gas Chemical Company Inc. and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 293,898, Jan. 5, 1989,. This application Aug. 27, 1990, Ser. No. 573,285

Claims priority, application Japan, Jan. 12, 1988, 63-3092

Int. Cl.[5] C07C *27/96, 31/04*

U.S. Cl. 518—704 4 Claims

1. A process for the production of methanol from hydrocarbon, which comprises the steps of:

(a) reacting hydrocarbon with steam to generate a synthesis gas composed of hydrogen, carbon monoxide and carbon dioxide as main components,

(b) reacting the synthesis gas on a methanol synthesis catalyst to synthesize crude methanol,

(c) feeding the crude methanol to a distillation column, without adding any alkaline compound to neutralize organic acids in the crude methanol, to distill the crude methanol and separate it into a purified methanol and effluent water containing low-boiling organic compounds, high-boiling organic compounds and organic acids, said distillation column composed of stainless steel having a composition of 18 to 20% by weight of Cr, 8 to 10.5% by weight of Ni and not more than 0.08% by weight of C in its portions contacting the low-boiling organic compounds, high-boiling organic compounds or organic acids,

(d) bringing the effluent water into contact with preheated gaseous hydrocarbon in an apparatus composed of stainless steel having a composition of 16 to 26% by weight of Cr, 6 to 14% by weight of Ni, 2 to 4% by weight of Mo and not more than 0.03% by weight of C in its portions contacting the low-boiling organic compounds, high-boiling organic compounds or organic acids to humidify the hydrocarbon, and

(e) feeding the humidified hydrocarbon for use in step (a),

wherein step (d) contains

a step of humidifying the hydrocarbon with the effluent water from step (c) by means of a heat exchanger humidifier using, as a heat source, heat of the synthesis gas generated in step (a), or

a step of humidifying the hydrocarbon, pre-heated to 250° to 430° C., with the effluent water from step (c) by means of a heat-insulated humidifier, and then humidifying the hydrocarbon with water by means of a heat exchanger humidifier using, as a heat source, heat of the synthesis gas generated in step (a).

5,063,251

BLOWING AND CURING OF RESINS AND PLASTICS MATERIALS WITH CYCLODEXTRIN COMPLEXES

Finn Bergishagen, Union Lake, Mich., assignor to American Maize-Products Company, Stamford, Conn.

Filed May 4, 1990, Ser. No. 518,794

Int. Cl.[5] C08J *9/12, 9/14*

U.S. Cl. 521—84.1 19 Claims

1. A method for expanding a plastic material comprising:

forming an admixture comprising a plastic, rubbery or resinous material and a complex of cyclodextrin and a blowing agent; and

heating said admixture so as to fluidize said plastic material and cause said blowing agent to expand said plastic material while said plastic material is in a fluidized state.

5,063,252

PROCESS FOR THE PRODUCTION OF PLASTICS BY THE POLYISOCYANATE POLYADDITION PROCESS AND CATALYSTS SUITABLE FOR THIS PROCESS

Andreas Ruckes, Leverkusen; Martin Brock, Cologne, and Richard Weider, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Nov. 7, 1989, Ser. No. 433,315

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1988, 3838128

Int. Cl.[5] C08G *18/20;* C07F *9/6584*

U.S. Cl. 521—108 1 Claim

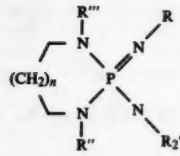
1. A process for the production of optionally cellular polyurethane by the isocyanate polyaddition process which comprises reacting

a) a polyisocyanate with

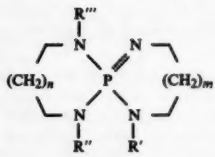
b) a compound containing at least two isocyanate-reactive groups and

c) a catalyst comprising one or more triamino(imino)phosphoranes corresponding to the following formulas

(I)



(II)



(III)

wherein

R represents hydrogen, a linear or branched alkyl group containing 1 to 8 carbon atoms, a cycloalkyl or alkylcycloalkyl group containing 5 to 9 carbon atoms, an aryl group or an alkylaryl group,

R′ represents a linear or branched alkyl group containing 1 to 8 carbon atoms, a cycloalkyl or an alkylcycloalkyl group containing 5 to 9 carbon atoms or a cycloalkylene group containing 4 to 6 carbon atoms,

R″ represents hydrogen, a linear or branched alkyl group containing 1 to 8 carbon atoms, a cycloalkyl or an alkylcycloalkyl group containing 5 to 9 carbon atoms, an aryl group or an alkylaryl group,

R‴ represents a linear or branched alkyl group containing 1 to 8 carbon atoms, a cycloalkyl or an alkylcycloalkyl group containing 5 to 9 carbon atoms, an aryl group or an alkylaryl group and

n and m may be the same or different and represent 0, 1, or 2.

5,063,253

PROCESS FOR THE PRODUCTION OF COLD-SETTING FLEXIBLE POLYURETHANE FOAMS WITH EXCELLENT DAMPING PROPERTIES

Peter Gansen, Cologne; Rudi Wolfgramm, Leverkusen; Klaus D. Wolf, Cologne, all of Fed. Rep. of Germany, and John J. Lindsey, Pittsburgh, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 312,524, Feb. 17, 1989, abandoned. This application Mar. 30, 1990, Ser. No. 502,346

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1988, 3806476

Int. Cl.[5] C08G *18/00*

U.S. Cl. 521—159 **20 Claims**

1. A process for the production of cold-setting flexible polyurethane foam useful for damping sound comprising reacting a polyisocyanate in the presence of water with

a) at least one polyether having an OH number of from 20 to 60 and containing at least two OH groups, wherein said polyether is based on 75 to 95% by weight propylene oxide and 5 to 25% by weight ethylene oxide;

b) a polyether or polyester having an OH number of from 150 to 400 and containing at least two OH groups, wherein said component b) is used in a quantity of from 10 to 20% by weight based on the total amount of components a), b), and c); and

c) a polyether different from components a) and b) having an OH number of from 20 to 200 and containing at least two OH groups, wherein said polyether is based on propylene oxide and ethylene oxide and has an ethylene oxide content above 50% by weight based on the total amount of propylene oxide and ethylene oxide, wherein said component c) is used in a quantity of from 30 to 70% by weight based on the total amount of components a), b), and c).

5,063,254

MTQ/POLYSILOXANE HYBRID RESINS, METHOD OF MAKING THE SAME, AND COATING/POTTING COMPOSITIONS CONTAINING THE SAME

Steven T. Nakos, Andover, Conn., assignor to Loctite Corporation, Hartford, Conn.

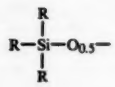
Continuation-in-part of Ser. No. 176,892, Apr. 4, 1988, abandoned. This application Nov. 27, 1989, Ser. No. 441,508

Int. Cl.[5] C08C *77/38, 77/20*

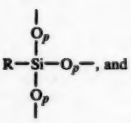
U.S. Cl. 522—43 **27 Claims**

1. A polysiloxane, comprising:

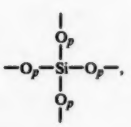
(I) an MTQ moiety having a plurality of pendant hydroxy groups and comprising a multiplicity of monofunctional siloxane units (M),



trifunctional siloxane units (T),



and tetrafunctional siloxane units (Q),



wherein:

p has a value of 0.5 when the associated oxygen atom is bonded to another silicon atom, and a value of 1 when the associated oxygen atom is bonded to other than a silicon atom, with the proviso that at least one p in each T and Q unit has a value of 0.5;

each R is independently selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, haloalkyl, (meth)acryloxyalkyl, and (meth)acryloxyalkenyl;

the concentration ratio of M units to the sum of T and Q units, M/(T+Q), in the MTQ moiety is from about 0.55 to about 0.75; and

(II) covalently bonded to the MTQ moiety, a diorganosiloxane polymer of the formula:

wherein:

A is an acrylic-functional end group;

R_1 and R_2 are each independently selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, haloalkyl, (meth-)acryloxyalkyl, and (meth)acryloxyalkenyl; and

n is from 25 to 1000.

5,063,255

PHOTOPOLYMERIZABLE TYPE RESIN COMPOSITIONS FOR DENTAL PURPOSES

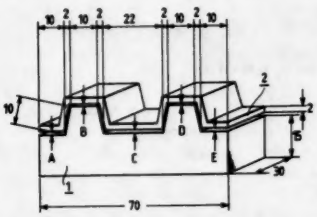
Akira Hasegawa, Inuyama; Hiroshi Mori, Chita; Tatsuhiko Takahashi, and Yasuyuki Sano, both of Nagoya, all of Japan, assignors to G-C Toshi Kogyo Corporation, Aichi, Japan

Filed Nov. 1, 1989, Ser. No. 430,590

Claims priority, application Japan, Nov. 18, 1988, 63-290160

Int. Cl.[5] C08F *18/02, 118/02, 218/02*

U.S. Cl. 522—96 **9 Claims**



1. A dental photopolymerizable resin composition consisting essentially of:

(a) at least one photopolymerizable compound that has therein at least one ethylenically unsaturated double bond present in a CH_2=CHCOO— or CH_2=$C(CH_3)$COO— group and is a solid either crystalline or amorphous at 40° C. and lower,

(b) an inorganic filler,

(c) a photopolymerization initiator, and

(d) a reducing agent.

5,063,256

DEODORIZING RESIN COMPOSITIONS AND FORMED DEODORIZING ARTICLES

Akira Hoshino, Koshigaya; Mikio Saji, Kasukabe, and Isamu Yamaguchi, Souka, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Division of Ser. No. 185,409, Apr. 25, 1988, Pat. No. 4,880,852, which is a continuation of Ser. No. 928,377, Nov. 10, 1986, Pat. No. 4,757,099. This application Sep. 12, 1989, Ser. No. 405,973

Claims priority, application Japan, Apr. 7, 1986, 61-078181; Apr. 7, 1986, 61-078182; Apr. 7, 1986, 61-198183; May 13, 1986, 61-107543

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] A61J *9/01;* C08K *3/22, 5/09;* C08L *1/12*

U.S. Cl. 523—102 **4 Claims**

1. A deodorized resin composition, consisting of:

99.5–50 parts by weight of a thermoplastic resin and 0.1–50 parts by weight of a combination of 10–90 parts by weight of a zinc compound and 90–10 parts by weight of an aromatic polycarboxylic acid or a salt thereof.

5,063,257

DENTAL GLASS IONOMER CEMENT COMPOSITIONS

Shoji Akahane, Higashikurume; Satoshi Tosaki, Omiya; Yukiharu Kusayanagi, Tokyo; Shigenobu Kusakai, Tokyo; Kazuo Hirota, Tokyo, and Kentaro Tomioka, Chofu, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 448,298

Claims priority, application Japan, Dec. 16, 1988, 63-316303

Int. Cl.[5] C08F *2/50;* A61K *6/08*

U.S. Cl. 523—116 **13 Claims**

1. A dental glass ionomer cement composition consisting essentially of:

(a) a polymer of an α-β unsaturated carboxylic acid having a weight average molecular weight of 5,000 to 40,000,

(b) a fluoroaluminosilicate glass powder having an average particle size of 0.02 to 10 μm and a specific gravity of 2.4 to 4.0 and capable of reacting with said "polymer of an α-β unsaturated carboxylic acid having a weight average molecular weight of 5,000 to 40,000",

(c) a polymerizable unsaturated organic compound having at least one CH_2=C(R1)—COO—group wherein R1=H or CH_3,

(d) a polymerization catalyst,

(e) water,

(f) a surface active agent, and

(g) a reducing agent.

5,063,258

COATING COMPOSITIONS CONTAINING MOLYBDENUM DISULFIDE

Fridolin Bäbler, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 5, 1989, Ser. No. 403,248

Claims priority, application Switzerland, Sep. 9, 1988, 3372/88

Int. Cl.[5] C08K *3/30*

U.S. Cl. 523—171 **18 Claims**

1. A coating composition for producing a metal effect coating without the concomitant use of metal powders, which composition comprises, as coloring component, 0.001 to 30% by weight of an organic pigment and 0.001 to 30% by weight of molybdenum disulfide, based on the weight of the dry coating produced therewith, the molybdenum disulfide being in flake or platelet form having a particle diameter of less than 100 μm and a thickness of up to 4 μm.

5,063,259

CLEAR, IMPACT-RESISTANT PLASTICS

Robert A. Wanat, Langhorne, Pa., and Charles C. Crabb, Mt. Laurel, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 3, 1990, Ser. No. 547,743

Int. Cl.[5] C08G *83/00;* C08F *6/14*

U.S. Cl. 523—201 **25 Claims**

1. A process for preparing a clear, impact-modified acrylic plastic with improved color which comprises:

(a) preparing in emulsion a heterogeneous core/shell polymer of at least one rubbery stage containing a preponderance of units derived from at least one alkyl acrylate and an outer stage containing a preponderance of units derived from methyl methacrylate;

(b) optionally adding at least one emulsion polymer which is preponderantly comprised of units derived from methyl methacrylate to form a polymer blend in emulsion form;

(c) subsequently adding from about 0.005 to about 0.025 parts of an phosphorus-containing inorganic reducing agent per 100 parts of emulsion, wherein the phosphorus-containing inorganic reducing agent is a water-soluble alkaline earth salt of a phosphorus-containing inorganic acid wherein the phosphorus is in a valence state of +3 or

+1 or a phosphorus-containing inorganic acid wherein the phosphorus is in a valence state of +3 or +1;

d) isolating the core/shell polymer or the polymer blend from the emulsion;

e) concurrently or subsequently blending the isolated polymer with a matrix polymer predominantly derived from units of methyl methacrylate to form the impact-modified acrylic plastic in molten form;

f) optionally adding other additives to the impact-modified acrylic polymer in molten form;

g) isolating the impact-modified acrylic plastic in solid form by extruding and cooling.

5,063,260

COMPOSITIONS AND THEIR USE FOR TREATING FIBERS

Kun-Long Chen, Taipei, and Yung-Yu Hsu, Tao Yuan, both of Taiwan, assignors to Dow Corning Corporation, Midland, Mich.

Filed May 1, 1991, Ser. No. 694,156

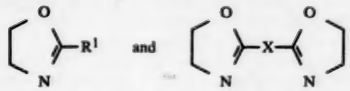
Int. Cl.[5] **C08L** *83/04;* **C04B** *31/00;* **C08K** *5/01;* **D06M** *15/66*

U.S. Cl. 523—213 **8 Claims**

1. A composition of matter comprising

(A) 36 to 94.9 weight percent of an amino organofunctional substantially linear polydiorganosiloxane polymer having the general formula

$$R''''R_2SiO(R_2SiO)_x(RSiO)_ySiR_2R'''';$$
$$\quad\quad\quad



(Ia) (Ib)

wherein R^1 is a straight-chain or branched alkyl group having from 1 to 20 carbon atoms, a cyclic and/or alkyl-substituted cyclic alkyl group having from 5 to 10 carbon atoms, a straight-chain or branched alkenyl group having from 3 to 18 carbon atoms, an alkyl-, halogen-, or hydroxyl-substituted aryl group, a straight-chain or branched alkoxyl group having from 1 to 20 carbon atoms, a straight-chain or branched alkylcarbonyl group having from 1 to 20 carbon atoms, or a cyano group;

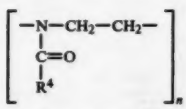
X is a straight-chain or branched alkylene group having from 1 to 20 carbon atoms, a cyclic and/or alkyl-substituted cyclic alkylene group having from 5 to 10 carbon atoms, a straight-chain or branched alkylene group having from 3 to 18 carbon atoms, an alkyl-, halogen-, cyano- or hydroxyl-substituted arylene group, a straight-chain or branched alkyleneoxy group having from 1 to 20 carbon atoms, or a straight-chain or branched alkylenecarbonyl group having from 1 to 20 carbon atoms;

and said primary stabilizer comprises (a) a compound of zinc of the formula (II)

$$R^2O—Zn—OR^3 \quad \text{(II)}$$

wherein R^2 and R^3 are identical or different and represent a straight-chain or branched, optionally hydroxyl-substituted aliphatic acyl group having from 8 to 21 carbon atoms or an aryl group which is optionally substituted by an alkyl group having from 1 to 22 carbon atoms,

and (b) at least one polymeric primary stabilizer selected from the group of polyoxazolines of the formula (III)



(III)

wherein each occurrence of R^4 may independently be a straight-chain or branched alkyl group having from 1 to 22 carbon atoms or a substituted or unsubstituted cycloalkyl or aryl group, and n represents an integer of from 10 to 10,000.

5,063,263

POLYACETAL COMPOSITIONS CONTAINING A NON-MELTABLE POLYMER STABILIZER IMPROVED WITH A MINOR AMOUNT OF AT LEAST ONE MELTABLE CO-STABILIZER AND AT LEAST ONE PRIMARY ANTIOXIDANT

Richard A. Hayes, Parkersburg; Leonard E. R. Kosinski, Washington, both of W. Va., and Mark E. Wagman, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 366,558, Jun. 15, 1989, abandoned. This application Jun. 11, 1990, Ser. No. 536,343

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.[5] C08K *00/00*

U.S. Cl. 524—101 **19 Claims**

1. A thermoplastic polyacetal composition consisting essentially of

(a) 0.05–3.0 weight percent of at least one non-meltable polymer selected from the group consisting of polymers containing formaldehyde reactive hydroxyl groups, polymers containing formaldehyde reactive nitrogen groups, and polymers containing both formaldehyde reactive hydroxyl groups and formaldehyde reactive nitrogen groups, provided that the atoms in the backbone of the polymer to which the formaldehyde reactive groups are attached, directly or indirectly, are separated from each other, on average, by not more than twenty chain atoms, and further provided that the amount of the formaldehyde reactive nitrogen groups attached, directly or indirectly, to the atoms which are in the backbone of the polymer is at least three times as great as the amount of formaldehyde reactive nitrogen groups present in the backbone of the polymer,

(b) 0.01–1.00 weight percent of at least one meltable co-stabilizer selected from the group consisting of polyamides, urethanes, ureas, hydroxy-containing polymers, and hydroxy-containing oligomers,

(c) 0.02–1.00 weight percent of at least one primary antioxidant selected from the group consisting of sterically hindered phenolic antioxidants and secondary aromatic amine antioxidants, and

(d) 95–99.9 weight percent of at least one polyacetal polymer,

provided that the above-stated percentages are based on the total amount of components (a), (b), (c), and (d) only, further provided that the polymer of component (a) has a number average particle size in the composition of less than 10 microns, and further provided that the atoms in the backbone of the hydroxy-containing polymers and hydroxy-containing oligomers of component (b) to which the hydroxy groups are attached, directly or indirectly, are separated from each other, on average, by not more than twenty chain atoms and wherein the hydroxy-containing polymers and hydroxy-containing oligomers are substantially free of acidic materials.

5,063,264

CRYSTALLINE POLYOLEFIN COMPOSITION

Hirokazu Nakajima, Chiba, Japan, assignor to Chisso Corporation, Japan

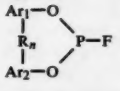
Filed Aug. 20, 1990, Ser. No. 569,658

Claims priority, application Japan, Aug. 28, 1989, 1-220947; Dec. 8, 1989, 1-320138

Int. Cl.[5] C08K *5/51*

U.S. Cl. 524—118 **23 Claims**

1. A crystalline polyolefin composition comprising 100 parts by weight of a crystalline polyolefin, (A) from 0.001 to 1 part by weight of a fluorophosphite compound represented by formula (I):



(I)

wherein R represents an alkylidene group having from 1 to 4 carbon atoms or a sulfur atom; Ar_1 and Ar_2, which may be the same or different, each represents an alkylarylene group or a cycloalkylarylene group; and n represents 0 or 1, and (B) from 0.001 to 1 part by weight of at least one compound selected from the group consisting of (1) an aliphatic monocarboxylic acid salt of lithium or sodium, (2) a dithiocarbamic acid salt of lithium, sodium or potassium, (3) a 2-mercaptobenzothiazole salt of lithium, sodium or potassium, (4) a 2-mercaptobenzimidazole salt of lithium, sodium or potassium and (5) a benzotriazole salt of lithium, sodium or potassium.

5,063,265
STABILIZED POLY(ARYL ETHER KETONE) COMPOSITIONS

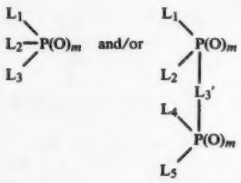
James E. Harris, Piscataway, N.J., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 189,390, May 2, 1988, abandoned. This application Jan. 3, 1990, Ser. No. 460,404

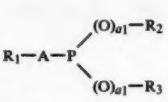
Int. Cl.[5] C08K *5/52, 5/53*

U.S. Cl. 524—126 **22 Claims**

1. A melt-stable composition comprising (a) a poly(aryl ether ketone) (b) a stabilizing amount of a combination of (i) an aromatic phosphorous compound selected from the group consisting of aromatic phosphorus compounds of the formulae:



where L_1, L_2, L_3, L_4 and L_5 are the same or different and are independently either Ar_1 or Ar_1O, Ar_1 being a monovalent aromatic radical having at least six carbon atoms; L'_3 is Ar_2 or OAr_2O, Ar_2 being an arylene radical of at least six carbon atoms; and m is an integer of 0 or 1, and aromatic phosphite and/or phosphonite compounds of the formula



where R_1, R_2 and R_3 are the same or different and are substituted or unsubstituted aryl radicals containing from six to about 30 carbon atoms; a_1 is 0 or 1 and A is a chemical bond or an oxygen atom, with the provisos that (1) both a_1's must be one when A is a chemical bond and only one a_1 can be zero when A is an oxygen atom; and (2) at least one of R_1, R_2 and R_3 must be an aromatic group; and (ii) an organic acid selected from the group consisting of formic, acetic, propronic, n-butyric, iso-butyric, n-valeric, iso-valeric, n-caproic, iso-caproic, β-chlorobutyric, γ-chlorobutyric, trans-cinnamic, o-, m-, and p-chlorocinnamic, benzoic, phenylacetic, α-phenylpropionic, β-phenylpropionic, γ-phenylbutyric, oxalic, fumaric, succinic, adipic, and citric acids.

5,063,266
NON-HALOGENATED INSULATION WITH HIGH OXYGEN INDEX

Howard F. McRae, Underhill, Vt., assignor to Champlain Cable Corporation, Winooski, Vt.

Filed Feb. 20, 1990, Ser. No. 482,386

Int. Cl.[5] C08J *3/28;* **C08K** *5/24*

U.S. Cl. 524—269 **36 Claims**

1. A fire retardant, non-halogenated wire and cable insulation, featuring increased tensile strength and elongation resulting from irradiation of a composition including:

a) an ethylene vinyl acetate base resin comprising approximately 100 parts by weight of the total composition, and containing carboxyl groups below approximately 3% by weight of said base resin;

b) a silicone material containing silanol groups and comprising approximately between 15 to 30 parts by weight of the total composition; and

c) a flame retardant hydrated filler material containing hydroxyl groups and comprising greater than 200 parts by weight of the total composition, said silanol groups linking both with the carboxylic groups of the ethylene vinyl acetate base resin, and the hydroxyl hydroxyl groups of the flame retardant hydrated filler material, said silanol groups having sufficient linkage with said carboxyl groups and said hydroxyl groups to provide said composition with a high, flame retardant, oxygen index, but having insufficient linkage capability to allow for extrusion of said composition into wire and cable insulation.

5,063,267
HYDROGEN SILSESQUIOXANE RESIN FRACTIONS AND THEIR USE AS COATING MATERIALS

Larry F. Hanneman; Theresa E. Gentle, both of Midland, Mich., and Kenneth G. Sharp, Landenberg, Pa., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 28, 1990, Ser. No. 618,865

Int. Cl.[5] C08K *3/22, 5/05;* **C08L** *83/05*

U.S. Cl. 524—284 **10 Claims**

5. Hydrogen silsesquioxane resin with a number average molecular weight of between about 700 and about 6000 and with a dispersity less than about 3.0.

5,063,268
COMPOSITION FOR TIRE TREADS (E-235)

Donald G. Young, Cranford, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jun. 8, 1990, Ser. No. 534,861

Int. Cl.[5] C08F *8/00;* **B60C** *11/00;* **C08L** *7/00*

U.S. Cl. 524—286 **28 Claims**

1. A tire tread composition comprising:

(a) halogen-containing copolymer of a C_4 to C_7 isomonoolefin and a para-alkylstyrene;

(b) a rubber selected from the group consisting of natural rubber, styrene-butadiene rubber, polybutadiene rubber, a terpolymer of ethylene, propylene and a nonconjugated diene, and mixtures thereof;

(c) carbon black;

(d) a plasticizer oil; and

(e) a curing agent.

5,063,269
ONE-PART PRIMERLESS ADHESIVE

Ju-Ming Hung, Yardley, Pa., assignor to Essex Specialty Products, Inc., Clifton, N.J.

Filed Jan. 16, 1990, Ser. No. 464,828

Int. Cl.[5] C08L *75/00*

U.S. Cl. 524—296 **17 Claims**

1. A one-part adhesive which comprises a mixture of:

(a) a polymerizable ethylenically unsaturated urethane polymer: and

(b) a polymerizable ethylenically unsaturated acid, acid salt, or acid anhydride

wherein component (b) is present in an amount in the range of from about 0.5 weight percent to about 25 weight percent of component (a).

5,063,270
CURABLE COMPOSITION

Sadao Yukimoto; Toshifumi Hirose; Hiroshi Wakabayashi, and Katsuhiko Isayama, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 7, 1989, Ser. No. 362,776

Claims priority, application Japan, Jun. 10, 1988, 63-144013

The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.

Int. Cl.[5] C08K *5/09*

U.S. Cl. 524—306 **12 Claims**

1. A curable composition which comprises:

(A) 100 parts by weight of oxyalkylene polymer which has at least one silicon-containing group containing a hydroxyl group and/or hydrolyzable group bound to a

silicon atom and capable of crosslinking through the formation of a siloxane bond;

(B) 1 to 150 parts by weight of a plasticizer having a number-average molecular weight from 500 to 15,000 and selected from the group consisting of a polyester, a polyether, a polystyrene, a polydiene, a polybutene and a hydrogenated polybutene; and

(C) 0.1 to 20 parts by weight of a compound having one silanol group per molecule and/or a compound capable of reacting with moisture to thereby form one silanol group per molecule.

5,063,271

HOT MELT WAX COMPOSITIONS

Richard L. Jones, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 307,655, Feb. 6, 1989, Pat. No. 4,965,306. This application May 31, 1990, Ser. No. 532,308

Int. Cl.[5] C08L *91/08, 23/04, 23/10*

U.S. Cl. 524—351 16 Claims

1. A wax composition which comprises from about 1 weight percent to about 80 weight percent of a fully refined paraffinic petroleum wax having a melting point of from about 120° F. to about 160° F., (b) from about 1 weight percent to about 80 weight percent of a recrystallized heavy intermediate petroleum wax having a melting point of from about 145° F. to about 185° F., and a clear color, (c) from about 1 weight percent to about 50 weight percent of a microcrystalline wax having a melting point of from about 150° F. to about 200° F., and (d) from about 10 weight percent to about 30 weight percent of a polymeric compound selected from the group consisting of ethylene-vinyl acetate copolymer, ethylene-ethyl acrylate copolymer and polypropylene and mixtures thereof, said polymeric compound having a molecular weight of from about 2,000 to about 100,000 and a melt index of from abut 1 to about 250° to 375° F.

5,063,272

POLYMERIC WEB COMPOSITIONS FOR USE IN ABSORBENT ARTICLES

Philip A. Sasse, Alpharetta, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 16, 1990, Ser. No. 598,276

Int. Cl.[5] C08L *33/06;* C08K *5/05*

U.S. Cl. 524—377 6 Claims

1. A composition of matter comprising a polymeric blend of from about 60 to about 95 weight percent of a copolymer of a (meth)acrylate ester and (meth)acrylic acid and from about 5 to about 30 weight percent polyethylene glycol.

5,063,273

PROTECTIVE HOUSING FOR APPARATUS

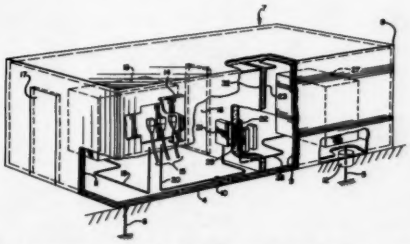
Hubertus M. H. A. Bloks, Elim, Netherlands, assignor to Fokker Special Products B.V., AN Hoogeveen, Netherlands

Filed Jan. 30, 1990, Ser. No. 472,322

Claims priority, application Netherlands, Feb. 1, 1989, 8900248

Int. Cl.[5] H05K *9/00*

U.S. Cl. 174—35 R 16 Claims



1. A housing for shielding an apparatus from electrical and magnetic signals and fields, electromagnetic radiation, crosstalk between signal carrying conductors and conducting parts, and leakage into the surrounding environment from the apparatus of electrical and magnetic signals, comprising:

a) an inner housing acting as a Faraday cage;

b) an outer housing acting as a Faraday cage enveloping the inner housing at a spaced position therefrom and defining an interstitial substantially continuous cavity therebetween; and

c) means for electrically insulating the inner housing from the outer housing;

d) first grounding means connected to the inner housing;

e) second grounding means connected to the outer housing; and

f) the first and second grounding means being spaced apart to avoid any galvanic, inductive or capacitive coupling between the first and second grounding means.

5,063,274

ELECTRIC FENCE INSULATOR

John I. Johnson, Ottawa, Canada, assignor to ITW Plastiglide, Concord, Canada

Filed Oct. 1, 1990, Ser. No. 590,711

Claims priority, application Canada, Sep. 29, 1989, 614990

Int. Cl.[5] H01B *17/16;* A01K *3/00*

U.S. Cl. 174—158 F 15 Claims

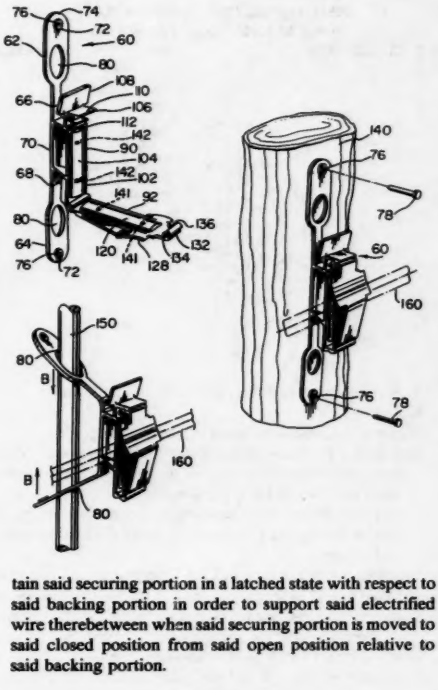
1. A plastic insulator for holding electrified wire, comprising:

means for supporting an electrified wire; and

means for selectively connecting said supporting means to a support structure;

said connecting means including an axially elongate structure comprising an axially central section and two arm sections extending in opposite directions with respect to each other from axially spaced end portions of said central section, first means defined within said two arm sections by which said supporting means may be connected to a suport structure with separate fastener means, and second means defined within said two arm sections by which said supporting means may be connected to a support structure without separate fastener means;

said supporting means comprising a backing portion, a securing portion hingedly connected to said backing portion for cooperating therewith in order to support said electrified wire therebetween when said securing portion is moved from an open position relative to said backing portion to a closed position relative to said backing portion, web means for fixedly supporting said backing portion of said supporting means upon said connecting means in spaced relation with respect to said central section of said connecting means, latch means provided upon said securing portion of said supporting means, and keeper means fixedly provided upon one of said backing portion and said web means for lockingly cooperating with said latch means of said securing portion so as to releaseably maintain said securing portion in a latched state with respect to said backing portion in order to support said electrified wire therebetween when said securing portion is moved to said closed position from said open position relative to said backing portion.



5,063,275

METHOD AND APPARATUS FOR GAS ANALYSIS

Eliezer Z. Rosenfeld, and Lewis Coleman, both of Jerusalem, Israel, assignors to Spegas Industries Ltd., Jerusalem, Israel

Filed Jun. 21, 1990, Ser. No. 541,637

Claims priority, application Israel, Jun. 25, 1989, 90744

Int. Cl.[5] G01N *21/61*

U.S. Cl. 250—343 10 Claims

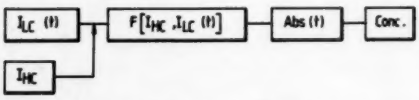
1. A method for analyzing gases to establish their concentration, comprising the steps of:

a) providing a radiant source, an analytical space, a radiation detector and a reference gas having a concentration HC beyond the range of concentrations of the gas to be analyzed,

b) establishing an instantaneous intensity $I_{LC}(t)$;

c) establishing an intensity I_{HC} with said analytical space filled with said reference gas;

d) calculating, from said values $I_{LC}(t)$ and I_{HC}, the instantaneous value of the absorbed intensity Abs(t), and



d) translating said absorbed intensity Abs(t) into concentration values.

5,063,276

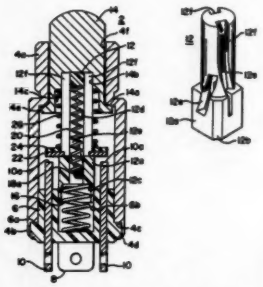
PUSHBUTTON SWITCH WITH ROTATIONAL CONTACT WIPING ACTION

Tony O. Woodard, Pine Level, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 20, 1990, Ser. No. 570,447

Int. Cl.[5] H01H *3/02, 13/14, 1/36*

U.S. Cl. 200—529 **16 Claims**



1. A pushbutton switch comprising, in combination:

a housing;

stationary contacts mounted in said housing;

a contact carrier disposed between said stationary contacts reciprocally movable normal to said stationary contacts between ON and OFF positions;

a helically shaped slot extending transversely through said carrier having an axis directed parallel to movement of said carrier;

movable contact means slidably disposed in said slot biased toward said stationary contacts opposite ends of said movable contact means extending beyond said carrier; and

said movable contact means being moved into abutting engagement with said stationary contacts and subsequently rotated on said stationary contacts by movement of said carrier to said ON position.

5,063,277

WATERPROOF AND DUSTPROOF PUSH SWITCH

T. Takano; Y. Kosuga, and K. Sinzawa, all of Tokyo, Japan, assignors to Daiichi Denso Buhin Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1990, Ser. No. 542,956

Claims priority, application Japan, Jun. 28, 1989, 1-76103; Aug. 2, 1989, 1-91141

Int. Cl.[5] H01H *13/12*

U.S. Cl. 200—531.0 **11 Claims**

1. A waterproof switch comprising:

an electrically insulating cylindrical base having an outer flange and confronting inner walls defining an interior space;

fixed contacts disposed to as to partially extend along respective said inner walls of said insulating cylindrical base;

an actuator movably disposed within said defined interior space of said base;

said actuator having a substantially inverted V-shaped contact which is movable with said actuator and is thereby adapted to come into contact with each of said fixed contacts to make an electrical circuit when said actuator is moved into an on position;

a spring disposed within said interior space and exerting a bias force upon said actuator;

a resilient waterproof cap having a side region which defines a recess, said cap being disposed so as to cover said actuator and said outer flange of said insulating cylindrical body; wherein

said outer flange of said insulating base includes a fastening pin which is accepted within said recess defined within said side region of said waterproof cap so as to prevent separation of said waterproof cap from said insulating base.

5,063,278

METHOD AND APPARATUS FOR SUPPLYING ELECTRIC POWER TO RESISTANCE WELDING GUN

Mitsuo Konno; Hisashi Noro, and Naotero Katsura, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1989, Ser. No. 368,828

Claims priority, application Japan, Jun. 22, 1988, 63-153873; Jun. 22, 1988, 63-153874

Int. Cl.[5] B23K *11/00*

U.S. Cl. 219—86.1 **13 Claims**

1. A method of supplying electric energy to a tiltable resistance welding gun having a pair of electrodes for gripping a workpiece and effecting resistance welding thereon, said method comprising the steps of:

tilting said resistance welding gun to grip said workpiece between said pair of electrodes, wherein tilting of said resistance welding gun moves a power receiver terminal mounted thereon from a first position to a second position adjacent a power supply terminal;

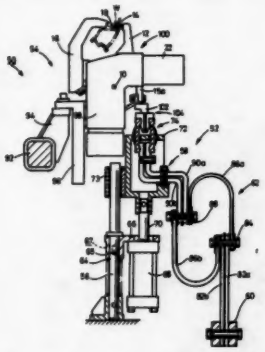
displacing said power supply terminal to connect said power receiver terminal and said power supply terminal to each other after the electrodes have gripped the workpiece therebetween;

supplying a welding current from said power supply terminal to said power receiver terminal;

displacing said power supply terminal to disconnect said power receiver terminal and said power supply terminal from each other; and

tilting said resistance welding gun to separate said electrodes

from said workpiece after said power receiver terminal and said power supply terminal have been disconnected



from each other, wherein tilting of said resistance welding gun moves said power receiver terminal from said second position to said first position.

5,063,279

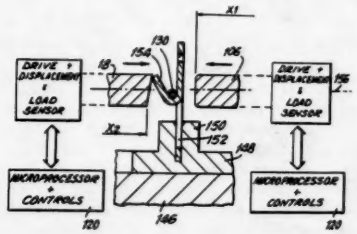
METHODS AND APPARATUS FOR FUSING ARMATURE AND STATOR WIRES

Alessandro Rossi, Florence, Italy, assignor to Axis USA, Inc., Marlborough, Mass.

Continuation-in-part of Ser. No. 412,279, Sep. 25, 1989, abandoned. This application Nov. 15, 1989, Ser. No. 436,633

Int. Cl.[5] B23K *11/24*

U.S. Cl. 219—86.51 **50 Claims**



46. A method for fusing armature wires to the commutator of an electric motor, comprising the steps of:

causing a fusing member to exert a predetermined force on a predetermined section of the commutator, said force corresponding to the force at which maximum surface contact between the fusing member and the commutator occurs;

determining whether the displacement of the fusing member from a reference point is within a predetermined range corresponding to an acceptable commutator condition;

applying electrical current to the fusing member to heat said fusing member and any portions of said commutator and armature wire in thermal contact with said fusing member;

applying force to the fusing member as a function of displacement according to a predetermined force function to deform said section of said commutator;

continuously monitoring the force applied to said fusing member during said step of applying force to said fusing member;

adjusting the force applied to said electrode in response to data obtained while monitoring the force applied to the electrode to maintain said predetermined force function, until said force equals a predetermined force which corresponds to an acceptable fusion condition; and

determining whether the displacement of the electrode from said reference point is within a predetermined range corresponding to an acceptable fusion condition.

5,063,280

METHOD AND APPARATUS FOR FORMING HOLES INTO PRINTED CIRCUIT BOARD

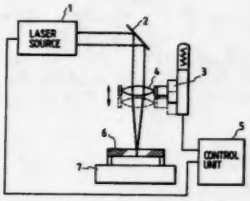
Hideho Inagawa, Yokohama, and Shigenobu Nojo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1990, Ser. No. 553,666

Claims priority, application Japan, Jul. 24, 1989, 1-188971; Jun. 12, 1990, 2-154685

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.7 **4 Claims**



1. A method of forming holes into a printed circuit board, comprising the steps of:

irradiating a hole to be formed in a printed circuit board with an energy beam;

pulsating the energy beam irradiating the hole to be formed; and

moving a focal point of the energy beam so it is focused in a new working surface in the hole as the hole forming process progresses.

5,063,281

WEAVING WELDING METHOD

Toru Mizuno, Tama, and Shigehiro Morikawa, Atsugi, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

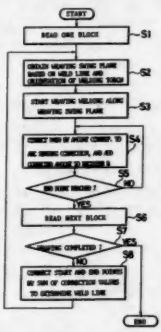
PCT No. PCT/JP89/00119, § 371 Date Oct. 6, 1989, § 102(e) Date Oct. 6, 1989, PCT Pub. No. WO89/07507, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 6, 1989, Ser. No. 427,102

Claims priority, application Japan, Feb. 10, 1988, 63-27648

Int. Cl.[5] B23K *9/127*

U.S. Cl. 219—125.12 **6 Claims**



1. A weaving welding method comprising the steps of:

(a) determining a desired weld line;

(b) detecting an orientation of a welding torch relative to the weld line;

(c) determining a weaving swing plane on the basis of the desired weld line and the detected orientation of said welding torch, said weaving swing plane including an intersecting line at which a first plane traversing said desired weld line at right angles thereto intersects a second plane perpendicular to an axis of said welding torch, and parallel to said desired weld line; and

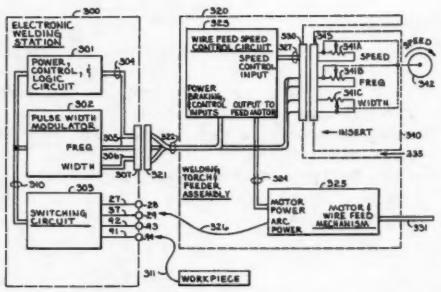
(d) moving said welding torch along said desired weld line while weaving the same with a predetermined width with respect to said desired weld line in a direction traversing said desired weld line, to move the distal end of said welding torch on said weaving swing plane.

5,063,282

APPARATUS AND METHOD FOR OPTIMIZING A WELDING OPERATION

Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30067

Division of Ser. No. 374,465, Jun. 30, 1989, Pat. No. 5,025,127.
This application Nov. 14, 1990, Ser. No. 612,815
Int. Cl.[5] B23K *9/09*
U.S. Cl. 219—130.51 **27 Claims**



7. For use with an electronic welding station having at least three welding parameters, a method whereby adjustment of a selected welding parameter automatically adjusts at least two other parameters of said welding parameters to achieve an optimum weld, comprising the steps of:

(A) (1) selecting a type of welding operation;

(2) selecting a control parameter for said type of welding operation;

(3) selecting a value for said control parameter;

(4) adjusting a second parameter and a third parameter of said welding parameters to achieve an optimum weld;

(5) recording said value for said control parameter, a value for said second parameter, and a value for said third parameter;

(6) repeating steps (2) through (5) for a selected range of values for said control parameter; and

(B) (1) constructing a first control to have an output which represents said value of said control parameter;

(2) constructing a second control which has an output which represents said value for said second parameter and a third control which has an output which represents said value for said third parameter and which outputs vary, as a function of said value of said control parameter, in correspondence with said values recorded in step (A)(5); and

(3) ganging said first control, said second control, and said third control;

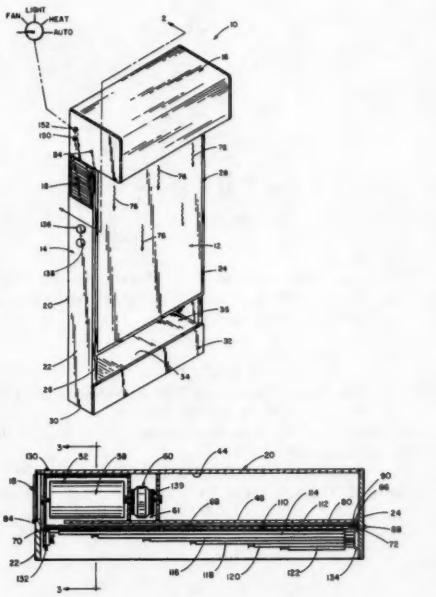
whereby adjustment of said control parameter causes said second parameter and said third parameter to be automatically adjusted to provide said optimum weld.

5,063,283

BATHROOM CABINET

William Orazi, 950 Colorado Ave. #6, Stuart, Fla. 33494

Filed Mar. 8, 1990, Ser. No. 490,353
Int. Cl.[5] H05B *3/64*
U.S. Cl. 219—218 **9 Claims**



1. A bathroom cabinet comprising:

A) a case unit which includes

(1) a planar rear wall having a rear surface located to be mounted on a support structure, such as a wall,

(2) first and second side walls mounted on said rear wall and extending forwardly therefrom and each having a front edge spaced from said rear wall, said case having a width dimension defined between said first and second side walls and a thickness dimension defined between said rear wall and said side wall front edges,

(3) a bottom wall mounted on said rear wall and extending forwardly thereof,

(4) a bottom mirror attached to said bottom wall and to said first and second side walls,

(5) a shelf attached to said first and second side walls,

(6) a main mirror attached to said first and second side wall front edges,

(7) a hood attached to said rear wall and to said first and second side walls and located on top of said case unit and extending in front of said main mirror and having a lower wall located adjacent to said main mirror, said lower wall having a forward wall and a plurality of conduits defined therethrough and directed towards said main mirror,

(8) a plurality of divider walls including

(a) first and second divider walls attached to said rear wall and to said hood forward wall and extending across the width dimension of said case, said first and second divider walls being parallel and spaced from each other,

(b) a third divider wall attached to said first and second divider walls and extending perpendicular to said first and second divider walls and having an air flow exit opening defined therethrough, and

(c) a fourth divider wall attached to said first divider

wall and extending perpendicular to said first divider wall toward said second divider wall, said fourth divider wall having a lower edge which is spaced from said second divider wall to define a gap between said second and said fourth divider walls,

(9) a plurality of chambers defined in said case by said divider walls including

(a) a fan compartment defined by said first, second and third divider walls,

(b) an air holding chamber defined by said first, second, third and fourth divider walls, said air holding chamber being fluidically connected to said fan compartment by said air flow exit opening, and

(c) a plenum defined by said second side wall, and said first, second and fourth divider walls, said plenum being fluidically connected to said air holding chamber by said gap,

(10) an air inlet defined through said first side wall and fluidically connected to said fan compartment,

(11) a flexible wall attached to said first side wall and located in said gap between said second and fourth divider walls, said flexible wall having a proximal end attached to said first side wall and a distal end, and being movable mounted to move between a first position completely closing said gap and a second position uncovering said gap, and

(12) a flexible wall moving means connected to said flexible wall, said flexible wall moving means including a flexible wall position sensor which generates a wall position signal corresponding to the position of said flexible wall relative to said first and second side walls;

B) an air flow assembly which includes

(1) a fan mounted in said fan compartment, said fan being fluidically connected to said air intake to receive ambient air,

(2) a selector switch mounted on said first side wall,

(3) a fan motor connected to said fan and to a source of power via said selector switch, and

(4) a fan output sensor mounted on said fan motor and generating a fan output signal corresponding to the output of said fan;

C) an air heating assembly which includes

(1) a plurality of heating elements mounted on said case side walls and connected to a source of power via said selector switch, each heating element having a length that differs from the length of adjacent heating elements, with a longest heating element of said plurality of heating elements being located adjacent to said gap,

(2) a control unit mounted in said case and connecting said heating elements to the source of power, said control unit including

(a) a temperature sensor mounted on said first side wall and generating a temperature signal corresponding to the temperature adjacent to said main mirror,

(b) a humidity sensor mounted on said first side wall and generating a humidity signal corresponding to the relative humidity adjacent to said main mirror,

(c) control circuit means,

(d) fan output signal receiving means connected to said circuit means,

(e) temperature signal receiving means connected to said circuit means,

(f) humidity signal receiving means connected to said circuit means,

(g) flexible wall position signal receiving means connected to said circuit means,

(h) a circuit element connecting said control circuit means to said heating elements and controlling the amount of power supplied to said heating elements to be a function of said temperature signal, said fan output signal, said flexible wall position signal, and said humidity signal; and

D) a light assembly mounted in said hood and including

(1) a fluorescent light; and

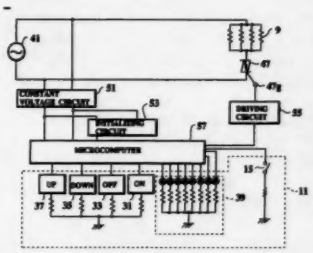
(2) means connecting said fluorescent light to said selector switch.

5,063,284

HEATING COOKER WITH TEMPERATURE CONTROL SYSTEM

Satoru Sunada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 20, 1990, Ser. No. 512,280
Claims priority, application Japan, Apr. 25, 1989, 1-103494
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—497 **5 Claims**



1. A heating cooker, comprising:

a heating lamp for emitting infrared rays to heat an object to be heated;

temperature detecting means for detecting an ambient temperature around said heating lamp, and providing a signal if the ambient temperature is higher than a preset value;

output controlling means for controlling a heat output of said heating lamp by decreasing the amount of energy supplied to the heating lamp per unit of time, upon receiving the signal from said temperature detecting means; and

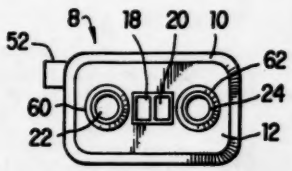
invalidating means for invalidating signals from said temperature detecting means for a predetermined time period after said output controlling means controls the heat output of said heating lamp.

5,063,285

COUNTING DEVICE

Joseph R. Curry, 11843 E. Cornell Cir., Aurora, Colo. 80014

Filed Oct. 11, 1989, Ser. No. 420,049
Int. Cl.[5] G06C *27/00, 1/00*
U.S. Cl. 235—114 **4 Claims**



1. A counting device comprising:

a housing having atop and a bottom with at least one window opening in the top of said housing;

means for attaching said housing to at least two fingers of one hand of a user so that said housing rests on the back surface of said hand of a user;

a plunger mounted for reciprocating movement within said housing and having one end thereof extending to the exterior of said housing, with said end extending to the exterior of said housing configured so that it may be depressed with the thumb of the same hand of the user to which said housing is attached; and

means for recording and displaying through said window opening the number of successive depressions of said

plunger comprising a plurality of discs, each having a front and back surface and having numerals on the front surface thereof, rotatability mounted within said housing and engaging said plunger so that successive depressions of said plunger causes rotation of one or more of said discs so that successive numerals on the front surface thereof are displayed through said window opening; and

a flange rigidly fixed to and extending perpendicularly below the bottom of said housing to contact said finger of a user thereby preventing inadvertent movement of the counting device.

5,063,286

LINE IMAGE SENSOR WITH PLURAL ELEMENTS ARRANGED AT A PREDETERMINED PITCH ACCORDING TO THERMAL EXPANSION

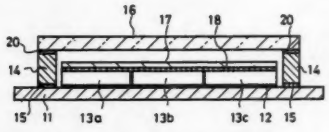
Yutaka Kaneko, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 410,848, Sep. 22, 1989, Pat. No. 4,999,484. This application Dec. 17, 1990, Ser. No. 628,005

Claims priority, application Japan, Sep. 26, 1988, 63-240353

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **7 Claims**



1. A multi-chip type image sensor comprising:

a base;

a plurality of sensor chips arranged into a line on said base, said sensor chips being fastened to said base by a die bonding process in which a first adhesive is used, each of sensor chips comprising silicon and a plurality of light receiving elements arranged into a line at a predetermined pitch;

a glass plate mounted on said sensor chips so as to cover said light receiving elements, said glass plate being fastened to said sensor chips by a second adhesive which hardens at a temperature lower than a curing temperature of said first adhesive; and

terminal pins supported on said base and electrically coupled to said sensor chips,

the following condition being satisfied:

$$|\alpha_3-\alpha_1|<|\alpha_2-\alpha_1|$$

where α_1 is a thermal expansion coefficient of said base, α_2 is a thermal expansion coefficient of each of said sensor chips, and α_3 is a thermal expansion coefficient of said glass plate.

5,063,287

PROCESSING CIRCUIT FOR OPTICAL COMBUSTION MONITOR

Adrian L. Trace, Solihull, Great Britain, and Mark J. Basten, Halesowen, England, assignors to Lucas Industries, Birmingham, England

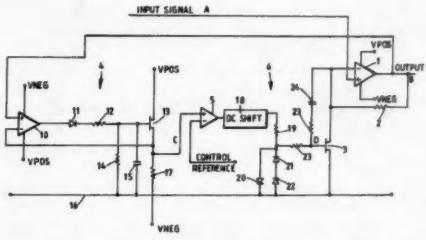
Filed May 30, 1990, Ser. No. 530,921

Claims priority, application United Kingdom, May 31, 1989, 8912462

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—214 AG **5 Claims**

1. A processing circuit for an optical combustion monitor, comprising a variable gain circuit having an input for connection to an optical transducer to receive an input signal, an output for providing an output signal having a peak amplitude, and a controllable variable gain; and gain controlling means connected to said output of said variable gain circuit for controlling the controllable variable gain of said variable gain



circuit so as to maintain substantially constant the peak amplitude of the output signal.

5,063,288

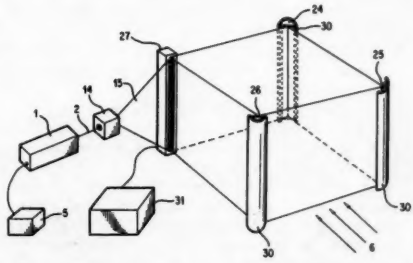
APPARATUS FOR SECURING A CONFINED SPACE WITH A LASER EMISSION

Chi-Hsueh Hsu, 4F, No. 144, Chu Lin Road, Yung Ho; Chin-Fen Huang, 2F, No. 3, Nung 13, Lane 38, Tien Yu St., Shih Lin, and Chun-Hsien Wang, 3F, No. 86, Mu Hsin Rd., Sec. 3, all of Taipei, Taiwan

Filed Aug. 23, 1989, Ser. No. 397,248

Int. Cl.[5] G01V *9/04*

U.S. Cl. 250—221 **2 Claims**



1. An apparatus for securing a confined space with a laser emission comprising:

a laser generator or tube for emitting a laser ray; a laser scattering device for converting said laser ray into a device for converting said laser ray into a divergent laser plane along a vertical plane;

reflection means spacedly arranged for sequentially reflecting said laser plane to form sequential laser planes therebetween; a sensor means having a plurality of sensor units in vertical alignment and facing reflecting laser plane from a last reflection member of the reflection means for detecting any intruder by interrupting any of the laser planes; identification means connected with sensors of the sensor means for automatically measuring a size and intrusion speed of the detected intruder;

means in combination with said measurement means for producing an inducted signal after a process of computation; means connected with the signal means to send out warning signals at least including radio communication signals as having received said inducted signal; and

a miniature receiver adapted to be carried along by a owner and sound warning signals upon having recieved said radio communication signals.

5,063,289

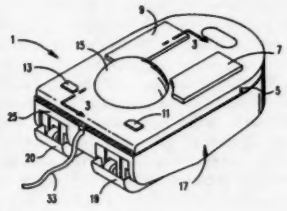
COMBINED MOUSE AND TRACKBALL

Joseph E. Jasinski, Delray Beach, Fla.; Charles H. Lingle, Nicholasville, Ky.; Richard F. Pollitt, Highland Beach, Fla., and David W. Shuman, Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed Oct. 9, 1990, Ser. No. 594,893

Int. Cl.[5] G01V *9/04;* G06M *7/00;* H01J *40/14*

U.S. Cl. 250—221 14 Claims



1. A combined mouse and trackball comprising a control ball to produce signals describing the rotation of said ball, a first cover and a second cover between which said ball is supported for rotation with only one continuous surface of said ball extending past said covers, at least one of said covers being hinged for movement between a retracted position and an extended position, a first latch to latch said covers in a first position in which said one surface of said ball is opposite a flat surface, and a second latch to latch said covers in a second position in which said one surface of said ball is supported on opposite sides to frictionally engage a flat surface.

5,063,290

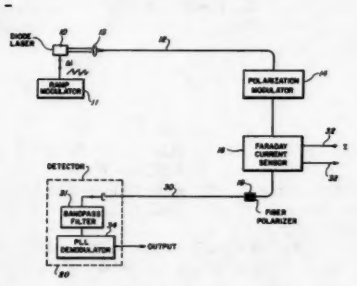
ALL-OPTICAL FIBER FARADAY ROTATION CURRENT SENSOR WITH HETERODYNE DETECTION TECHNIQUE

Alan D. Kersey, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1990, Ser. No. 582,274

Int. Cl.[5] H01V *5/16;* G01B *9/02*

U.S. Cl. 250—227.17 16 Claims



1. A sensor system for detecting an electric current, said system comprising:

source means for providing an input beam of frequency-modulated linearly-polarized light;

polarization modulation means for converting said input beam of frequency-modulated light into polarization-modulated light;

current sensing means for imparting a Faraday rotation to said polarization-modulated light as a function of the magnitude of the electric current to be detected; and

means for measuring said Faraday rotation of said polarization-modulated light to determine the magnitude of said electric current.

5,063,291

OPTICAL GRATING WITH INTERPOLATOR HAVING MULTIPLYING MEANS TO PRODUCE QUADRATURE SIGNALS

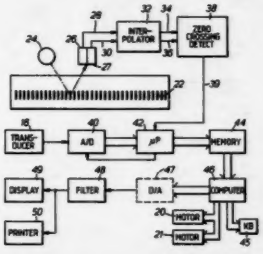
Ian K. Buehring, Leicester, United Kingdom, assignor to Rank Taylor Hobson Limited, United Kingdom

Filed Jun. 22, 1990, Ser. No. 542,707

Claims priority, application United Kingdom, Jun. 23, 1989, 8914417

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.16 16 Claims



1. An interpolator for receiving quadrature input signals at a first frequency and producing quadrature output signals at a second frequency which is a multiple of the first frequency, comprising means for producing first and second signals at double said first frequency and substantially in quadrature if the input signals are in quadrature, said producing means comprising squaring means for squaring one only of said input signals to provide said first signal and multiplying means for multiplying said input signals together to provide the second signal.

5,063,292

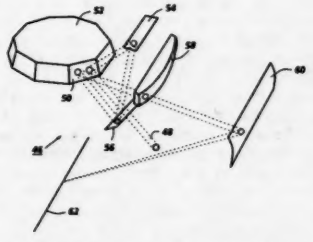
OPTICAL SCANNER WITH REDUCED END OF SCAN WOBBLE HAVING AN EVEN NUMBER OF BEAM REFLECTIONS

Harry P. Brueggemann, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1990, Ser. No. 515,799

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—236 8 Claims



1. An optical scanning system for reducing wobble at the ends of a scan line in a scan plane comprising:

a rotating polygon having a plurality of facets,

a collimated laser beam directed onto one of said facets from a location offset below the scan plane,

a mirror system to cause an even number of reflections of said laser beam before said laser beam is reflected off said facet a second time,

a cylindrical scan lens system which focuses in the scan plane said laser beam twice reflected off said facet to said scan line, and

a cylindrical mirror which focuses in a cross-scan plane said laser beam which has passed through said scan lens system to said line.

5,063,293

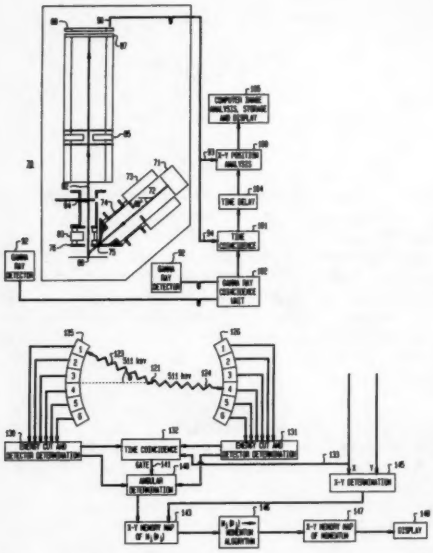
POSITRON MICROSCOPY

Arthur Rich, and James C. Van House, both of Ann Arbor, Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 359,951, Jun. 1, 1989, abandoned, which is a division of Ser. No. 118,550, Nov. 9, 1987, Pat. No. 4,864,131. This application Nov. 23, 1990, Ser. No. 618,521

Int. Cl.[5] H01J *37/26*

U.S. Cl. 250—308 **10 Claims**



1. A positron microscope system for producing magnified images of a specimen target, the positron microscope system comprising:

slow positron source means for producing a source beam formed of low energy positrons;

focusing means for focusing said source beam and directing said low energy positrons of said source beam onto the specimen target;

single particle image enhancement means for producing an image responsive to a target beam formed of particles emitted from the specimen target, said single particle image enhancement means being characterized by;

target plate means having a region having first and second dimensions for receiving the incident particle, said target plate means emitting a multiplicity of electrons in response to the incident particle; and

resistive anode encoder means arranged to receive at least one of said multiplicity of electrons from said target plate means, for providing a location signal responsive to the location of impingement of said incident particle in said region of said target plate means, and a timing signal responsive to a timing of said impingement of said incident particle in said region of said target plate means;

gamma ray detector means for detecting gamma rays which issue from the specimen target and producing a gamma ray detector signal responsive to said detection of said gamma rays; and

timing coincidence means for producing a signal responsive to a timing coincidence between said timing signal and said gamma ray detector signal.

5,063,294

CONVERGED ION BEAM APPARATUS

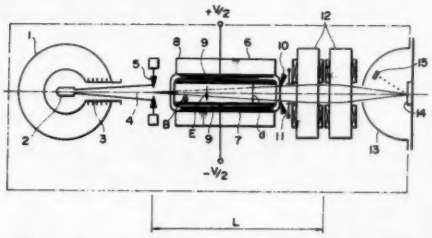
Yutaka Kawata; Ken-ichi Inoue; Kiyotaka Ishibashi; Akira Kobayashi, all of Kobe; Koji Inoue, Tokyo; Norio Suzuki; Akio Arai, both of Kobe; Kaneo Yamada, Akashi; Keizo Tokushige, Matsubara; Hirofumi Fukuyama, Kobe; Shigeto Adachi, Kobe; Yukito Furukawa, Kobe; Sunao Takahashi, Kobe, and Makoto Kimura, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 17, 1990, Ser. No. 524,432

Claims priority, application Japan, May 17, 1989, 1-125373; Aug. 8, 1989, 1-206457; Nov. 20, 1989, 1-302392; Jan. 11, 1990, 2-4841; Jan. 22, 1990, 2-13284; Mar. 7, 1990, 2-57501

Int. Cl.[5] G01W *23/00*

U.S. Cl. 250—309 **19 Claims**



1. A converged ion beam device for an apparatus wherein a high energy charge beam in the form of an ion beam from an accelerator is introduced in a spot to a specimen by way of an ion type classifying device, comprising an objective collimator and a beam collector to perform reforming of a surface or an analysis of physical properties and/or composition of a small area of the specimen, wherein said objective collimator is disposed just on the downstream of said accelerator, and an analyzing component for analyzing an ion type and/or energy of said ion beam is interposed in a drift space in an object distance between said objective collimator and a quadruple pole magnetic lens.

5,063,295

SLIT DISPOSITION STRUCTURE OF FIXED SLIT DISK IN PULSE ENCODER

Eiki Asaba; Yoshihito Tanabe, both of Yamanashi, and Kiyoshi Tagami, Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP89/01303, § 371 Date Aug. 23, 1990, § 102(e) Date Aug. 23, 1990, PCT Pub. No. WO90/07693, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 26, 1989, Ser. No. 571,545

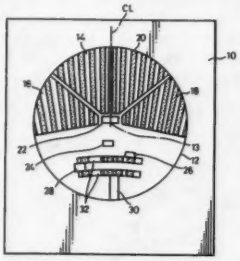
Claims priority, application Japan, Dec. 28, 1988, 63-329117

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.14 **2 Claims**

1. A slit disposition structure of a fixed slit disk in a pulse encoder having a light emitting diode, a rotary slit disk, a fixed slit disk, and a light receiving device, having absolute type slits and a plurality of increment type slit groups, and detecting the angular position or rotational speed of a rotary body, characterized in that the plurality of increment type slit groups are disposed radially on said fixed slit disk around the optical axis

of one said light emitting diode and in that absolute type slits are disposed around said optical axis and inside an arc formed



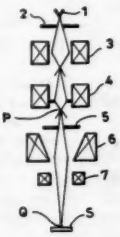
by the extension of the outer circumference of said plurality of increment type slit groups.

5,063,296

ELECTRON-OPTICAL SYSTEM FOR MAKING A PSEUDOPARALLEL MICRO ELECTRON-BEAM

Shigeki Hayashi, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed May 31, 1990, Ser. No. 531,362
Int. Cl.[5] H01J *37/141*
U.S. Cl. 250—396 ML **2 Claims**



1. An electron-optical system comprising:
a thermal electron source for emitting a diverging electron beam;
a condenser electron-lens assembly for converging said diverging electron beam to a first converging point; and
an asymmetric objective electron lens arranged, with its smaller field-gradient side directed to said condenser electron-lens assembly, for producing a micro electron beam having a beam converging angle of the order of 1×10^{-3} radian by converging to a final converging point a diverging electron beam proceeding from said first converging point, said micro electron beam giving an electron beam spot with a diameter not larger than 1 μm at said final converging point.

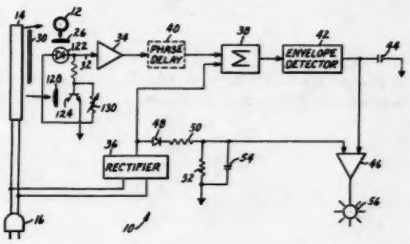
5,063,297

APPARATUS FOR DETECTING FLUORESCENCE OF A LUMINESCENT MATERIAL

James M. Hardenbrook, Longwood; Richard E. Williams, Lake Mary, and Mark L. Daniel, Deltona, all of Fla., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 364,194, Jun. 8, 1989, Pat. No. 5,030,832. This application Apr. 27, 1990, Ser. No. 515,203
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] G01J *1/58*
U.S. Cl. 250—458.1 **14 Claims**

1. An apparatus for detecting the fluorescence of a target luminescent material being excitable at an excitation wavelength and fluorescing at a fluorescing wavelength, comprising:
a discharge lamp adapted to be coupled to an alternating current voltage source operating at a source frequency and arranged to excite said target luminescent material at approximately said excitation wavelength;
first response means arranged to be responsive to said target luminescent material at approximately said fluorescing wavelength for providing a first electrical response as a function of the electromagnetic energy received from said target luminescent material at said fluorescing wavelength;
second response means arranged to be responsive to said discharge lamp for providing a second electrical response as a function of the electromagnetic energy received from said discharge lamp;



said first response means and said second response means being arranged such that said first electrical response opposes said second electrical response creating a combined output signal;
a band pass filter coupled to said combined output signal selected to pass predominantly signals of a frequency of approximately twice said source frequency to produce a filtered output signal;
a phase detector coupled to said band pass filter to detect the phase of said filtered output signal and producing a first response when said filtered output signal is of a first phase and producing a second response when said filtered signal is of a second phase; and
an indicator coupled to said phase detector to indicate the condition of said fluorescence of said target luminescent material as a function of at least one of said first response and second response.

5,063,298

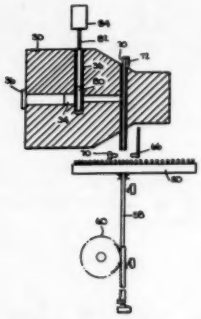
IRRADIATOR FOR DOSIMETER BADGES

Joseph D. Freitas, Jr., BelleMead, N.J.; Yoshikazu Tatsumi, Roselle, Ill., and Hiroyuki Furukawa, River Edge, N.J., assignors to Matsushita Electric Corporation of America, Secaucus, N.J.

Filed Jun. 15, 1990, Ser. No. 538,994
Int. Cl.[5] G21F *5/02*
U.S. Cl. 250—497.1 **13 Claims**

1. An apparatus for uniformly irradiating a plurality of materials with a known dose of radiation comprising:
(a) a radiation shield housing having a channel provided therein;
(b) a radiation source placed at one end of said channel for transmitting a radiation beam therethrough;
(c) means for positioning at least one of said plurality of materials at the other end of said channel, said means for positioning being controlled to expose each of said plurality of materials to said known dose of radiation;
(d) a radiation attenuator for reducing the intensity of said radiation beam to obtain a lower dose rate;
(e) means for interposing said radiation attenuator between said radiation source and said one material positioned at said other end of said channel to select said lower dose rate; and

(f) a filter means interposed between said radiation beam and said one material to prevent undesirable radiation gener-



ated in said radiation shield housing from impinging upon said one material during irradiation thereof.

5,063,299

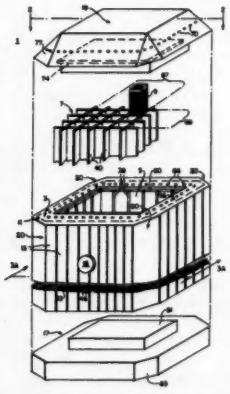
LOW COST, MINIMUM WEIGHT FUEL ASSEMBLY STORAGE CASK AND METHOD OF CONSTRUCTION THEREOF

Larry E. Efferding, Richland, Wash., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 18, 1990, Ser. No. 553,515

Int. Cl.[5] G21F *5/00*

U.S. Cl. 250—507.1 **40 Claims**



1. A cask for the storage of a radioactive structure having a polygonal cross-section, comprising:

a shield wall assembly for defining a cask interior that is polygonal in cross-section and complementary in shape to said structure, consisting of a plurality of flat metallic wall plate members having uniform thicknesses and mutually parallel and adjoined side edges;

a floor plate attached to the bottom of said wall assembly, and

a lid detachably connectable to the top of the wall assembly.

5,063,300

METHOD AND APPARATUS FOR DETERMINING LINE CENTERS IN A MICROMINIATURE ELEMENT

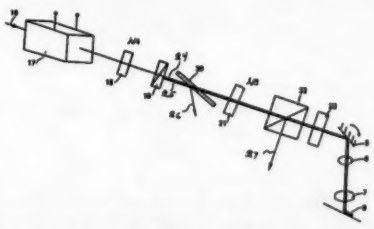
Michael Kallmeyer, Boeblingen, and Dietmar Wagner, Stuttgart, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1990, Ser. No. 546,216

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1989, 89112541

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **10 Claims**



9. A method for determining the center of a line on a workpiece by use of a light beam and the measurement of light reflected by the line on the workpiece comprising the following steps:

generating a light beam,

pulsing said light beam,

splitting said light beam into a direct beam and a reference beam,

directing and focussing the direct beam on a line on a workpiece,

scanning said light beam across the line,

collecting light reflected from the scanned line,

developing an analog electrical measurement signal of the light reflected by the scanned line and an analog electrical reference signal of the reference beam,

filtering said measurement signal and said reference signal by eliminating the DC and the noise components in said electrical measurement signal and in said electrical reference signal, respectively,

generating a filtered measurement signal having maximum and minimum values,

digitizing the maximum and minimum values of said filtered measurement signal and of said filtered reference signal,

processing of said digitized values of said measurement signal and said reference signal to generate a correlated measurement signal and eliminating noise in said correlated signal,

processing said digitized values of said correlated measurement signal to generate correlated sine shaped curves, a first of said sine shaped curves being generated by computing the difference quotient of the curve created by the digitized maximum values, and a second of said sine shaped curves by computing the difference quotient of the curve created by the digitized minimum values, and

determining the intersection point of said sine shaped curves with the zero line to establish the center of the scanned line.

5,063,301

NONINVASIVE METHOD AND APPARATUS USING COHERENT BACKSCATTERING FOR PROCESS CONTROL

Leonid A. Turkevich, Hudson, and Kee-Ju Choi, Euclid, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

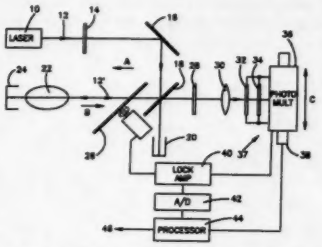
Filed Dec. 21, 1989, Ser. No. 454,367

Int. Cl.[5] G01N *15/06*

U.S. Cl. 250—574 **9 Claims**

1. A method for determining a size for particles of a known

concentration in a sample of a colloidal or particulate suspension, the method comprising: illuminating the sample with a source of coherent electromagnetic radiation; measuring a



coherent backscattering line shape; and computing the size by comparing the measured coherent backscattering line shape to a plurality of known coherent backscattering line shapes corresponding to known sizes.

5,063,302

WIDE BAND TRIGGER SYSTEM HAVING SWITCHABLE SIGNAL PATHS FOR EXTENDING THE EFFECTIVE FREQUENCY RANGE

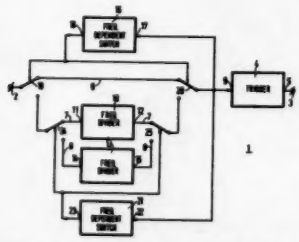
Wilhelmus D. H. van Groningen, Eindhoven, and Hubertus A. Caris, Enschede, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1989, Ser. No. 324,377

Claims priority, application Netherlands, Mar. 21, 1988, 8800697

Int. Cl.[5] **H03K** *5/00;* **G01R** *13/24;* **H03L** *7/00*

U.S. Cl. 307—271 **18 Claims**



1. A system for triggering an oscilloscope comprising:

an input terminal for a repetitive trigger signal,

a first signal path,

a second signal path parallel to the first signal path and which includes a first frequency division device for dividing the frequency of the trigger signal applied thereto,

a trigger device for generating triggering pulses for said oscilloscope when the repetitive trigger signal is supplied thereto, and

switching means for selectively switching said first and second signal paths between said input terminal and an input of said trigger device, wherein the switching means further comprises at least one frequency-dependent switching device responsive to the trigger signal for switching the signal paths depending on the frequency of the trigger signal.

5,063,303

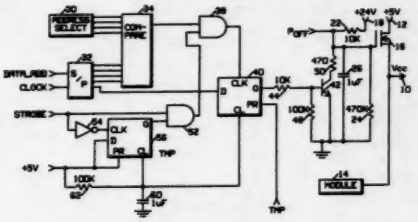
SOFT START CIRCUIT

Edward J. Sackman, and Donald L. Wray, both of Sunrise, Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Feb. 8, 1991, Ser. No. 652,850

Int. Cl.[5] **H03K** *3/00*

U.S. Cl. 307—296.1 **10 Claims**



1. A circuit for providing soft starting current for circuit modules which may be selectively plugged into a bus, said bus including an active power supply connection, the circuit comprising in combination:

a very low drain to source resistance field effect transistor having a gate, a drain, a source and a current path from said power supply through said drain and said source for supplying power to said module when said field effect transistor is turned on;

a capacitor;

a resistor; and

means, responsive to plugging in said module, for applying current through said resistor to charge said capacitor and slowly turn on said field effect transistor to supply power to said module; whereby,

the power at said module supplied through said field effect transistor is slowly increased to its quiescent level thereby inhibiting voltage sags at said bus and current surges into said module.

5,063,304

INTEGRATED CIRCUIT WITH IMPROVED ON-CHIP POWER SUPPLY CONTROL

Narasimhan Iyengar, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1990, Ser. No. 515,977

Int. Cl.[5] **H02J** *7/00;* **G05F** *1/56, 5/08;* **H03K** *3/027*

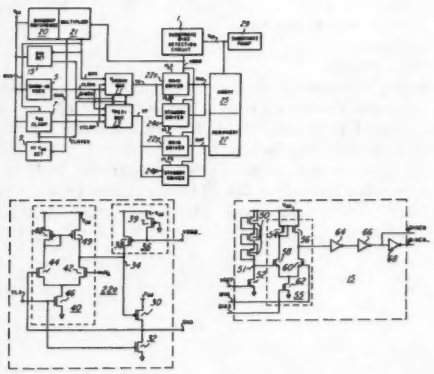
U.S. Cl. 307—296.6 **16 Claims**

1. An integrated circuit, comprising:

functional circuitry biased at a bias node;

a terminal for receiving a power supply voltage; and

a circuit, coupled to said terminal, for biasing said bias node of said functional circuitry with a clamped voltage responsive to said power supply voltage at said terminal exceeding a first limit.



5,063,305
CURRENT MIRROR AMPLIFIER CIRCUIT

Hiroshi Minami, and Koreaki Fujita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushik Kaisha, Tokyo, Japan

Division of Ser. No. 218,888, Jul. 14, 1988, Pat. No. 4,907,201, which is a continuation of Ser. No. 46,509, May 6, 1987, Pat. No. 4,767,942. This application Apr. 14, 1989, Ser. No. 338,896
Claims priority, application Japan, May 7, 1986, 61-104292
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[5] H03K *3/01, 3/353;* **H03F** *3/45*
U.S. Cl. 307—304 **4 Claims**

1. A transistor circuit, comprising:

first and second voltage amplifier circuits, each including:

first and second active loads;

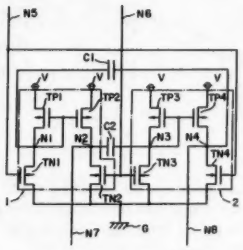
a first field-effect drive transistor, connected to pull current through said first active load, and a second field-effect drive transistor, connected to pull current through said second active load;

said first drive transistor and said first active load being connected at a first node, which is also connected to regulate the impedance of said second active load;

said second drive transistor and said second active load being connected at a second node, which is also connected to provide an output signal of said voltage amplifier;

a first input signal being connected to said first drive transistor of said first amplifier and to said second drive transistor of said second amplifier, and a second input signal being connected to said second drive transistor of said first amplifier and to said first drive transistor of said second amplifier;

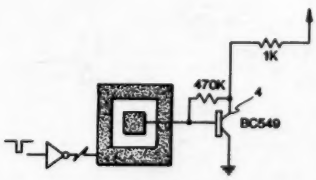
said second node of said first voltage amplifier being coupled to partially drive said first node of said second voltage amplifier, and said second node of said second voltage amplifier being coupled to partially drive said first node of said first voltage amplifier.



5,063,306
PROXIMITY SENSING DEVICE

Jeffery D. Edwards, Como, Australia, assignor to Intellect Electronics Ltd., Australia

PCT No. PCT/AU86/00043, § 371 Date Sep. 24, 1987, § 102(e) Date Sep. 24, 1987, PCT Pub. No. WO87/04851, PCT Pub. Date Aug. 13, 1987
Continuation of Ser. No. 131,194, Sep. 24, 1987, abandoned. This PCT application Feb. 20, 1986, Ser. No. 525,294
Claims priority, application Australia, Jan. 30, 1986, PH04377
Int. Cl.[5] H03K *00/00;* **G06G** *7/12;* **G01N** *27/00*
U.S. Cl. 307—308 **10 Claims**



1. A proximity sensing device comprising:

a sensor including a planar capacitor having a central region and an outer region, the capacitance value of said planar capacitor being substantially unaffected by the presence of a proximity body adjacent to said sensor;

means for forming a spiked output in response to a drive input pulse having at least one stepped edge, said planar capacitor forming part of said means for forming a spiked output pulse;

amplitude comparator means in circuit connection with said means for forming a spiked output pulse for receiving said spiked output pulse and repeatedly comparing the amplitude of said spiked output pulse with a reference datum, the amplitude of said spiked output pulse being influenced by said proximity body located adjacent said sensor, said amplitude comparator means providing a proximity sensing output signal when the amplitude of said spiked output pulse is reduced as compared with said reference datum,

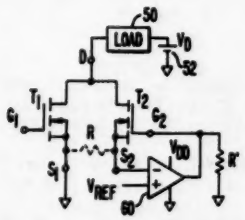
said proximity sensing output signal thereby providing an indication of whether said proximity body is located adjacent said sensor.

5,063,307

INSULATED GATE TRANSISTOR DEVICES WITH TEMPERATURE AND CURRENT SENSOR

Nathan Zommer, Los Altos, Calif., assignor to IXYS Corporation, San Jose, Calif.

Filed Sep. 20, 1990, Ser. No. 585,847
Int. Cl.[5] G05F *3/26*; H01L *29/78*
U.S. Cl. 307—310 **6 Claims**



1. A semiconductor device in combination with temperature sensing circuitry comprising:

a first insulated gate transistor having a first drain node, a first gate node, and a first source node;

a second insulated gate transistor, monolithic with and much smaller than said first transistor, having a second drain node, a second gate node, and a second source node;

said first and second drain nodes having a common connection;

a resistor coupled between said first and second source nodes;

means defining a reference voltage; and

an operational amplifier having a first input terminal coupled to said reference voltage, a second complementary input terminal coupled to said second source node, and an output terminal coupled to said second gate node;

whereupon when current flows from said second drain node, through said second gate insulated transistor, through said resistor, and to said second source node, the voltage appearing at said second gate terminal provides a direct measure of the temperature of said second insulated gate transistor.

5,063,308

OUTPUT DRIVER WITH STATIC AND TRANSIENT PARTS

Shekhar Borkar, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

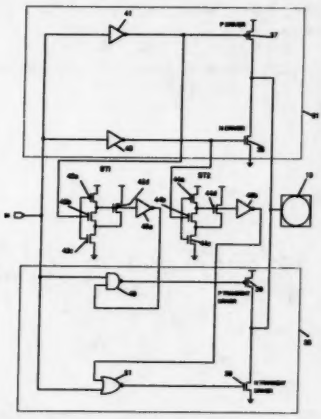
Division of Ser. No. 287,915, Dec. 21, 1988, Pat. No. 4,975,598.
This application Jan. 11, 1990, Ser. No. 463,406
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—443 **5 Claims**

1. In a large scale integrated circuit formed by a predetermined process, said circuit including at least one output driver comprising:

static means coupled to a driver input of said output driver for generating an output of said output driver as a function of said driver input;

level detection means coupled to said static means for monitoring said static means and generating first and second signals indicating that said output is beginning to change from a first logic level to a second logic level and from said second logic level to said first logic level;

transient means coupled to said static means and said level detection means operating substantially only during transitions i) from said first logic level to said second logic level for assisting the output of said static means to reach the second logic level and ii) from said second logic level to said first logic level for assisting the output of said static means to reach the first logic level and thereby reduce a rate of change of current flowing through said output driver; wherein said static means comprises:



a P transistor driver coupled to an N transistor driver;

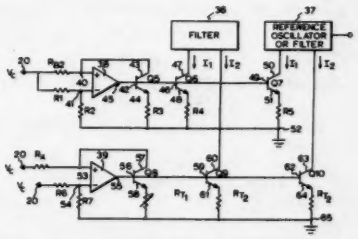
a first predriver having an input coupled to said driver input and having an output coupled to said P transistor driver and a second predriver having an input coupled to said driver input and having an output coupled to said N transistor driver.

5,063,309

HIGH FREQUENCY CONTINUOUS TIME FILTER

Richard G. Yamasaki, Torrance, Calif., assignor to Silicon Systems, Inc., Tustin, Calif.

Filed Mar. 28, 1990, Ser. No. 500,778
Int. Cl.[5] H03K *5/00*; H04B *1/00*
U.S. Cl. 307—521 **15 Claims**



1. A continuous time filter circuit comprising:

at least one filter element having a first equivalent resistance and a first equivalent capacitance, said first equivalent resistance dependent on a first and second current and the product of said first equivalent capacitance with said equivalent resistance dependent on a current ratio of said first and second currents;

a first current generating means coupled to said filter element for generating said first current;

a second current generating means coupled to said first filter element for generating said second current;

said second current dependent on a ratio of resistance between a first resistor and a second resistor coupled to said second current generating means, said first resistor being an adjustable resistor;

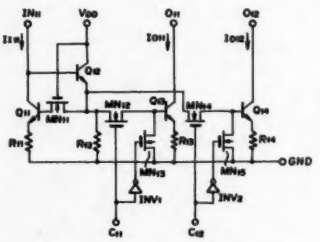
an oscillating means coupled only to said first and second current generating means during a first mode of operation, said oscillating means providing a reference frequency.

5,063,310

TRANSISTOR WRITE CURRENT SWITCHING CIRCUIT FOR MAGNETIC RECORDING

Eiji Shinozaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 16, 1990, Ser. No. 614,510
Claims priority, application Japan, Nov. 17, 1989, 1-299341
Int. Cl.[5] H03F *3/04*
U.S. Cl. 307—570 **17 Claims**



1. A transistor circuit comprising a current mirror circuit including an input current terminal, a first, second, third and fourth bipolar transistors, and first and second output current terminals; said first bipolar transistor being connected to said input current terminal and a source potential to produce a base current for each of said second, third and fourth bipolar transistors, said second bipolar transistor constituting an input-side transistor connected to said input current terminal, and said third and said fourth bipolar transistor constituting output-side transistors connected to said output current terminals, respectively, and said second, third and fourth bipolar transistors being coupled to a reference potential and supplied with said base current; and

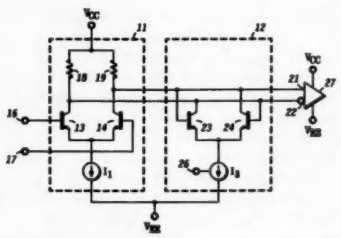
an output-side transistor on-off control circuit including first and second MOS transistors connected to the bases of said third and said fourth bipolar transistor for on-off switching of the base currents thereto in response to control signals applied to said first and second MOS transistors through first and second control terminals, respectively.

5,063,311

PROGRAMMABLE TIME DELAY CIRCUIT FOR DIGITAL LOGIC CIRCUITS

Mavin C. Swapp, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 4, 1990, Ser. No. 533,231
Int. Cl.[5] H03K *5/159*; G06G *7/12*; H03G *3/10*
U.S. Cl. 307—603 **10 Claims**



1. A logic circuit having first and second differential inputs and first and second differential outputs which are responsive to the inputs comprising: a means for delaying a response at one of the outputs when a change occurs at the differential inputs, wherein the means for delaying is controlled by an external signal and is coupled to each of the differential outputs, wherein the means for delaying a response further comprises

a first transistor having a collector, base, and emitter, wherein the collector of the first transistor is coupled to the first differential output and the base of the first transistor is coupled to the second differential output; and

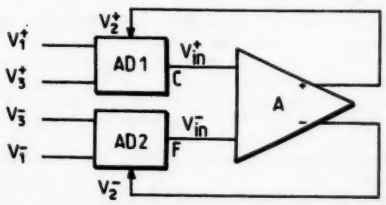
a second transistor having a collector, base, and emitter, wherein the collector of the second transistor is coupled to the second differential output and the base of the second transistor is coupled to the first differential output, and the emitter of the second transistor is coupled to the emitter of the first transistor.

5,063,312

DELAY CIRCUIT WITH ADJUSTABLE DELAY

Stéphane Barbu, Caen, and Laurent Le Pailleur, Herouville St. Clair, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 27, 1990, Ser. No. 618,778
Claims priority, application France, Nov. 28, 1989, 89 15624
Int. Cl.[5] H03K *5/13, 5/159*
U.S. Cl. 307—603 **8 Claims**



1. A delay circuit with adjustable delay employing a switching flip-flop which comprises: a differential amplifier having a first and a second input and a first and a second output, the first and second output being feedback-looped respectively onto the first and the second input so as to produce said switching flip-flop, the looping including a first and a second adder, each adder having a first, a second and a third input and an output, said first inputs of the first and second adder being connected to respectively the first and second output of the differential amplifier to produce said feedback looping, the second inputs being connected respectively to a first and a second terminal to receive a signal to be delayed (V_1^+, V_1^-) and the third inputs being adapted to receive a first and a second control voltage ($V_3^+V_3^-$), said delay being a function of the difference between the first and the second control voltage (V_3^+, V_3^-), and the outputs of the first and second adders being connected respectively to the first and second inputs of the differential amplifer.

5,063,313

DELAY CIRCUIT EMPLOYING DIFFERENT THRESHOLD FET'S

Shigeru Kikuda; Hiroshi Miyamoto, and Michihiro Yamada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 155,541, Feb. 12, 1988. This application Dec. 29, 1989, Ser. No. 459,238
Claims priority, application Japan, Feb. 25, 1987, 62-41837
Int. Cl.[5] H03K *5/13, 17/284, 17/30*
U.S. Cl. 307—605 **20 Claims**

1. A delay circuit comprising:

an input for receiving an input signal;

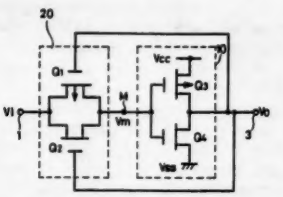
an output for outputting an output signal;

transmission gate means having a first field effect device of a certain conductivity type and a second field effect de-

vice of the opposite conductivity type each having the source, drain and insulated gate with said source and drain being arranged in operational relation wherein

respective sources of said first and second field effect devices are directly connected together at a node to form a first terminal of said transmission gate means,

respective drains of said first and second field effect devices are directly connected together at a node to form a second terminal of said transmission gate means,



one of said first and second terminals of said transmission gate means constitutes said input; and

inverter means connected between a power supply and the ground, wherein

the input of said inverter means is connected to said output of said transmission gate means,

the output of said inverter means constitute said output, and

the gates of said first and second field effect devices of said transmission gate means are directly connected together to said output.

5,063,314

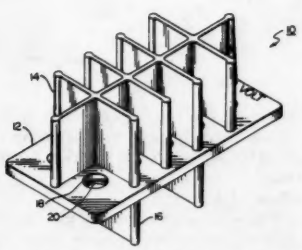
MISWIRE-PROOF INTERCONNECTING TERMINAL BLOCK

John J. DeSantis, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 29, 1990, Ser. No. 604,537

Int. Cl.[5] H01R *9/16*

U.S. Cl. 310—71 **3 Claims**



1. A miswire proof phase barrier means comprising:

a plate of a non-arc tracking material having a first side and a second side and a plurality of spaced bores having essentially parallel axes and extending through said plate;

a plurality of jumper bars having at least two bores which are spaced in accordance with said spacing of said spaced bores in said plate;

each of said jumper bars being located on and attached to said first side of said plate in registration with associated ones of said bores in said plate;

first axial phase barrier means located on said first side and generally parallel to said axes of said bores in said plate and separating each of said jumper bars and said associated bores in said plate from all other bores on said first side of said plate; and

second axial phase barrier means located on said second side and generally parallel to said axes of said bores in said plate and separating each of said bores in said plate from each of the other bores in said plate.

5,063,315

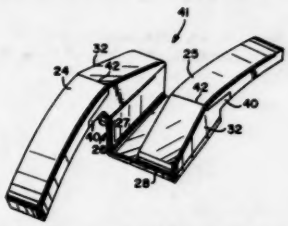
ELECTRICAL COIL CONNECTOR FOR DYNAMOELECTRIC MACHINE WINDINGS

Paul C. Rasmussen, Schaghticoke, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,978

Int. Cl.[5] H02K *3/28, 3/00*

U.S. Cl. 310—71 **28 Claims**



1. An electrical connector for laterally spaced apart opposite ends of a pair of adjacent electrical coils of a dynamoelectric machine comprising in combination

a) a pair of connector end pieces each of which is adapted for connection to a respective one of said coil ends, and

b) a bridging member adapted to multiplanar bridge the said laterally spaced coil ends for connection to said connector end pieces.

5,063,316

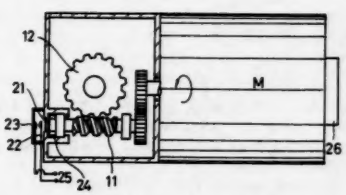
AUTOMATIC DOOR PROTECTIVE REVERSING SWITCH WITH WORM GEAR

C. E-Ming, No. 2, Lane 519, Chung Ho Rd., Yung Ho City, Taipei Hsien, Taiwan

Continuation of Ser. No. 335,403, Apr. 10, 1989, abandoned. This application Jun. 26, 1990, Ser. No. 542,663

Int. Cl.[5] F16K *31/50*; H01H *3/16*; H02K *7/06*

U.S. Cl. 310—83 **1 Claim**



1. An automatic door protective device comprising:

a motor having an output shaft; a driving gear mounted on said shaft; a driven gear shaft and driven gear thereon engaging said driving gear; a worm mounted on said gear shaft coaxially with said driven gear; a worm wheel shaft and a worm wheel mounted thereon engaging said worm; pulley means coaxially mounted on said wheel shaft for opening and closing said door responsive to rotation of said output shaft; a leaf spring disposed a predetermined distance from the end of said gear shaft opposite said driven gear; and electrical contact disposed adjacent and normally spaced a predetermined distance away from said leaf spring; an insulator disposed between the end of said gear shaft and said leaf spring; cushion means supporting said gear shaft and normally urging said worm into engagement with said worm wheel; signal means electrically coupled between said left spring, said electrical contact and said motor for reversing rotation of said motor when said door encounters an obstacle forcing said pulley means to stop rotation of the wheel shaft and worm wheel whereby the rotation of said motor will axially displace said worm and gear shaft until the end thereof forces said

leaf spring into electrical engagement with said electrical contact closing an electrical circuit.

5,063,317

ELECTRIC MOTOR, ESPECIALLY AN ELECTRIC SMALL-POWER MOTOR FOR DRIVING WIPER SYSTEMS OF MOTOR VEHICLES

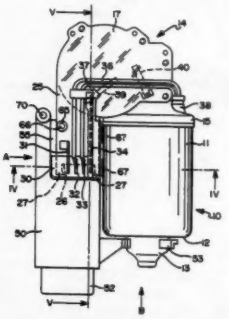
Rainer Bruhn, Karlsruhe, Fed. Rep. of Germany, assignor to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Oct. 25, 1989, Ser. No. 427,052

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1988, 3838285

Int. Cl.[5] H02K *5/00*

U.S. Cl. 310—91 **15 Claims**



1. An electric motor for driving wiper systems of motor vehicles comprising:

a substantially cylindrical motor housing having a longitudinal axis and a bottom with a bulge extending outward from said bottom of said motor housing and aligned with said axis of said motor housing;

an electronics housing positioned beside said motor housing;

and means extending between said electronics housing and said bulge including an eye for attaching said electronics housing to said motor housing.

5,063,318

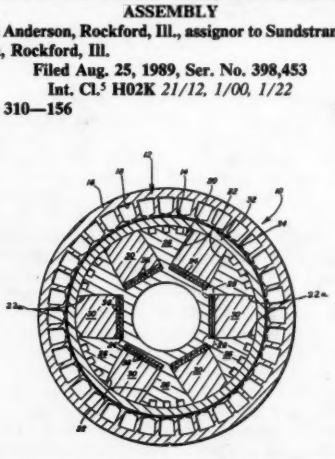
PRELOADED PERMANENT MAGNET ROTOR ASSEMBLY

W. Kyle Anderson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 25, 1989, Ser. No. 398,453

Int. Cl.[5] H02K *21/12, 1/00, 1/22*

U.S. Cl. 310—156 **9 Claims**



1. In a dynamoelectric machine of the permanent magnet type, a rotor assembly comprising:

a hub having a plurality of outwardly converging annularly spaced slots separated by outwardly diverging partition portions of the hub,

at least one said slot being defined by an outwardly facing bottom and circumferentially spaced sidewalls, said sidewalls converging in a radially outward direction only from a point spaced radially outwardly from the bottom;

a plurality of outwardly converging permanent magnets respectively disposed in the slots;

a containment shell surrounding the hub; and

wedge means between a base of each permanent magnet and a bottom of its respective slot for loading the permanent magnets radially outwardly toward the containment shell and against sides of the slots to place the partition portions of the hub under tension at least in a static condition of the rotor assembly,

said wedge means comprising first and second wedge-shaped members having spaced-apart ends with different thicknesses, each of said wedge-shaped members arranged in opposite juxtaposed relationship with the wedge members forcibly positioned in a direction axially of the rotor to bias one of the magnets radially outwardly toward the containment shell.

5,063,319

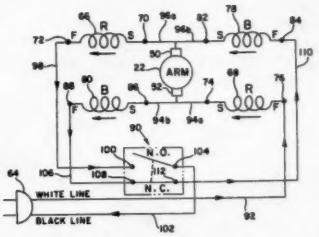
UNIVERSAL MOTOR WITH SECONDARY WINDING WOUND WITH THE RUN FIELD WINDING

John G. Mason, Rising Sun; John W. Miller, Parkton; William D. Sauerwein, Phoenix, and Stephen L. Vick, Reisterstown, all of Md., assignors to Black & Decker, Inc., Newark, Del.

Filed May 15, 1989, Ser. No. 351,995

Int. Cl.[5] H02K *3/16, 11/00;* **H02P** *3/00, 3/06*

U.S. Cl. 310—210 **31 Claims**



1. A universal electric motor having a longitudinally extending axis of rotation and comprising: an armature including a commutator and having, in terms of electrical connection, first and second sides:

a stator subassembly;

a first run field winding included in the stator subassembly and having first and second ends, the first end being connected to the first side of the armature;

a second run field winding included in the stator subassembly and having first and second ends, the first end being connected to the second side of the armature, said first and second run windings respective second ends being connectable to a source of electrical power so that the run windings and armature are connected in series with the armature electrically between the windings;

a first auxiliary field winding included in the stator subassembly and having first and second ends, the first end being connected to the first side of the armature;

a second auxiliary field winding included in the stator subassembly and having first and second ends, the first end being connected to the second side of the armature; and

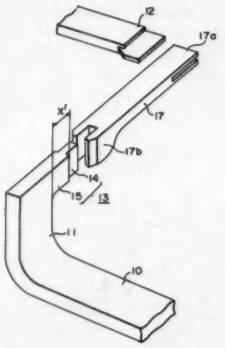
switch means operable to disconnect the run windings from the source of electrical power and to connect the second ends of the respective first and second auxiliary windings together so as to change the mode of operation of the motor to an auxiliary mode.

5,063,320

FEEDER LEAD WIRE OF ROTOR FOR ELECTRIC MACHINE

Takashi Watanabe, and Tatsuro Ishizuka, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 14, 1990, Ser. No. 582,094
Claims priority, application Japan, Sep. 18, 1989, 1-240016
Int. Cl.[5] H02K *3/48*
U.S. Cl. 310—270 8 Claims



3. In a rotor for an electric rotating machine, comprising a rotatable shaft; an iron core rotatable with said rotatable shaft; a rotor winding wound in a laminated manner and partially extending from said iron core in an axial direction; and a feeder lead wire connected to an inner end of said rotor winding so as to supply field current to said rotor winding;

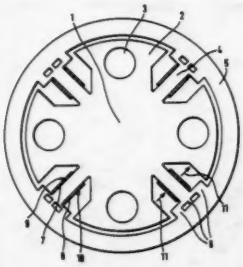
wherein said feeder lead wire has a plate-like rising portion extending radially outwardly of said rotatable shaft, and a connecting end portion extending from a side surface of an end of said plate-like rising portion in a circumferential direction of said rotatable shaft, said connecting end portion being brazed to the inner end of said rotor winding.

5,063,321

TORSIONAL VIBRATION DRIVE

Robert E. Carter, Arlington, Mass., assignor to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

PCT No. PCT/EP88/01152, § 371 Date Aug. 24, 1990, § 102(e) Date Aug. 24, 1990, PCT Pub. No. WO89/08237, PCT Pub. Date Sep. 8, 1989
PCT Filed Dec. 14, 1988, Ser. No. 573,199
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805631
Int. Cl.[5] H01L *41/08;* F16F *1/18*
U.S. Cl. 310—323 3 Claims



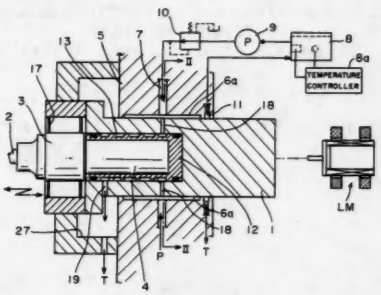
1. A torsional vibration drive for a laser gyro comprising a hub which is fastened to a base plate and is connected with a rim by way of a plurality of radial spokes, with the rim being connected with the laser gyro and holding the center of gravity of the laser gyro on the axis of the torsional vibration drive (rotation axis), the drive further comprising plates of a piezoelectric material which are applied to the lateral faces of the spokes and electrodes thereabove so as to cause the rim to perform oscillating vibrations about the axis of rotation when an alternating voltage is applied, with a flexural member being formed in each region of the transition from a spoke (4; 11) to the rim (5; 13), there is formed a flexural member (6; 15) which exhibits great flexibility for rotation of the rim about the axis of rotation, characterized in that the flexural member (6) is formed of a radially extending web (6B) and two webs (6A and 6C) which correspond to one another in the tangential direction.

5,063,322

FEED MECHANISM WITH A SLIDING MEMBER GUIDED BY A HYDROSTATIC BEARING

Kazuhiko Sugita, Anjo; Nohumitsu Hori, Ichinomiya, and Yasumasa Nakane, Takahama, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 27, 1990, Ser. No. 572,256
Claims priority, application Japan, Aug. 30, 1989, 1-221819
Int. Cl.[5] H01L *41/08;* F16C *17/00*
U.S. Cl. 310—341 6 Claims



1. A feed mechanism wherein a sliding member is movably guided by guide surface formed on a guide base, and an additional actuator generating heat during operation and connected to a movable member to be moved is embedded in a front end of said sliding member, said feed mechanism comprising:

hydrostatic bearing means provided on said guide surfaces and each having pressure pockets to which pressurized fluid is fed to support said sliding member;

a cooling jacket at the periphery of said additional actuator and having an oil channel formed therein for removing heat generated by said additional actuator;

a cooling oil feeding channel formed in said sliding member to connect said hydrostatic bearing means and said oil channel of said cooling jacket; and

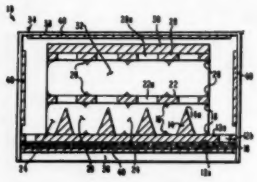
a cooling oil discharge channel formed in said sliding member to connect said oil channel of said cooling jacket and a space whose pressure is lower than that in said oil channel.

5,063,323

FIELD EMITTER STRUCTURE PROVIDING PASSAGEWAYS FOR VENTING OF OUTGASSED MATERIALS FROM ACTIVE ELECTRONIC AREA

Robert T. Longo, Arcadia; Zaher Bardai, Torrance; Arthur E. Manoly, Rancho Palos Verdes, all of Calif.; Ralph Forman, Rocky River, Ohio, and Randy K. Rolph, Redondo Beach, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 16, 1990, Ser. No. 552,643
Int. Cl.[5] H01J *01/30*
U.S. Cl. 313—309 19 Claims



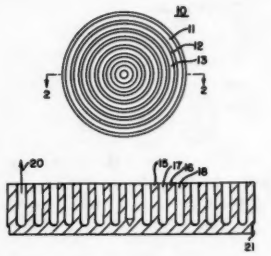
1. A field emitter structure, comprising:
an electrically conductive base;
a plurality of electrically conductive, pointed field emitters upstanding from a surface of the base;
electrode means supported above said surface, portions of the electrode means adjacent to the points of the field emitters being separated therefrom by open spaces respectively; and
passageway means interconnecting said open spaces, said passageways and open spaces being formed through an insulating layer between the base and said electrode means.

5,063,324

DISPENSER CATHODE WITH EMITTING SURFACE PARALLEL TO ION FLOW

Henry C. Grunwald, Bethlehem, Pa., assignor to ITT Corporation, New York, N.Y.

Filed Mar. 29, 1990, Ser. No. 502,078
Int. Cl.[5] H01J *1/28, 61/09*
U.S. Cl. 313—346 DC 20 Claims



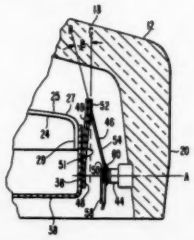
1. A dispenser cathode for use in a gas filled tube as an electron emitting surface with said cathode fabricated from a porous refractory metal interspersed with an electron emitting material, with said cathode when in operation subjected to ion back bombardment which undesirably can deplete said electron emitting material from said surface, the improvement herewith comprising:
at least one aperture located on said emitting surface and characterized in having steep vertical walls separated one from the other by a given distance such that said steep vertical walls of said at least one aperture extend to a specified depth not to exceed the thickness of said cathode with respect to said given distance whereby said at least one aperture does not pass through said cathode to enable said cathode to emit electrons when heated with said steep vertical walls operating to cause bombarding ions which impinge upon said wall to cause emitting material to deposit on the opposite wall.

5,063,325

COLOR PICTURE TUBE HAVING IMPROVED SHADOW MASK-FRAME ASSEMBLY SUPPORT

Frank R. Ragland, Jr., Lancaster, Pa., assignor to Thomson Consumer Electronics Inc., Indianapolis, Ind.

Filed Mar. 16, 1990, Ser. No. 494,364
Int. Cl.[5] H01J *29/07*
U.S. Cl. 313—405 3 Claims



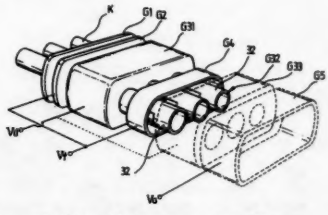
1. In a color picture tube including an evacuated glass envelope having a rectangular faceplate panel, said panel including a shadow mask assembly mounted therein by support means located at peripherally spaced positions within said panel, said support means providing thermal compensation for expansion of said shadow mask assembly, the thermal compensation being a movement of said shadow mask assembly toward a screen of said tube as the shadow mask assembly expands, said support means at each of said spaced positions including a stud attached to said glass envelope, a spring having an aperture therein engaging said stud, and a plate welded between said spring and said shadow mask assembly, the improvement comprising the combination of
said spring being angled with respect to said shadow mask assembly to provide approximately half of the required compensation, and
said plate being constructed of bimetallic materials and being of appropriate thickness and length to provide the approximately remaining half of the required compensation.

5,063,326

DYNAMIC FOCUS ELECTRON GUN

Suk-rae Cho, Suwon, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Japan

Filed Jan. 16, 1990, Ser. No. 465,494
Claims priority, application Rep. of Korea, Mar. 9, 1989, 89-2899
Int. Cl.[5] H01J *29/58*
U.S. Cl. 313—414 4 Claims



1. A dynamic focus electron gun comprising:
a triode for initially forming at least one electron beam; and
a main lens for focusing and accelerating the electron beam

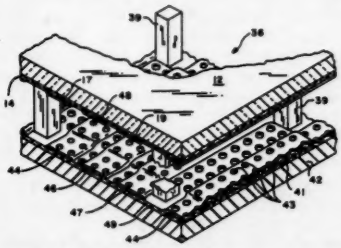
with dynamic electric fields including an auxiliary electrode comprising at least one cylindrical member including an electric field introducing window aperture for introducing an electric field into the auxiliary electrode and an oblong tubular electrode surrounding said member opposite said electric field introducing window aperture of said cylindrical member of the auxiliary electrode.

5,063,327

FIELD EMISSION CATHODE BASED FLAT PANEL DISPLAY HAVING POLYIMIDE SPACERS

Ivor Brodie, Palo Alto; Henry R. Gernick, Pleasanton; Christopher E. Holland, Redwood City, and Helmut A. Moessner, Saratoga, all of Calif., assignors to Coloray Display Corporation, Fremont, Calif.

Division of Ser. No. 215,603, Jul. 6, 1988, Pat. No. 4,923,421.
This application Jan. 29, 1990, Ser. No. 471,927
Int. Cl.[5] H01J *9/24*
U.S. Cl. 313—482 5 Claims



1. An electronic device comprising:
an array of field emission cathodes providing an electron emitting surface;
a display panel having a face including an anode opposing said surface; and
a plurality of prebaked spacers of uniform height of an organic polymer and substantially free of volatile material, said spacers extending between said surface of said face;
said electron emitting surface and said display panel being sandwiched together with said spacers defining a space therebetween, said space being subjected to a vacuum during emission of electrons from said field emitting surface to said display panel.

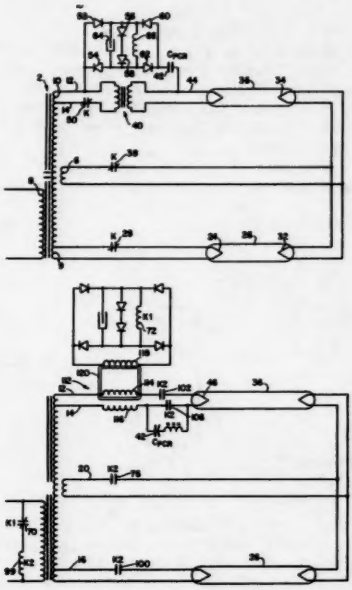
5,063,328

ENERGY SAVING CIRCUIT FOR DISCHARGE TUBES

John F. Walton, 6853 Strata St., McLean, Va. 22101

Continuation of Ser. No. 942,710, Dec. 17, 1986, abandoned.
This application May 26, 1988, Ser. No. 199,279
Int. Cl.[5] H05B *39/00*
U.S. Cl. 315—96 17 Claims

1. In a circuit for energizing and including at least one discharge type tube and a ballast with a primary winding and at least two secondary windings, filament circuits for connecting each filament of a discharge type tube across a different secondary of a ballast each secondary winding providing sufficient voltage to heat the filaments of a discharge type tube to incandescence; the voltage between the secondary windings being sufficient to induce plasma current through a discharge type tube; a filament control circuit comprising:
means responsive to plasma current through a discharge type tube to substantially terminate current through at least one of the filament circuits;
a current dropping capacitor connected in series with said responsive means between one of said secondary windings and a filament of a tube,
an isolation circuit inserted between said one of said secondary windings and said filament of the tube to which said capacitor is connected,
a relay having a coil and a plurality of normally closed contacts with at least one contact in series with each said filament circuit,
said coil maintains said current through said discharge tube, and



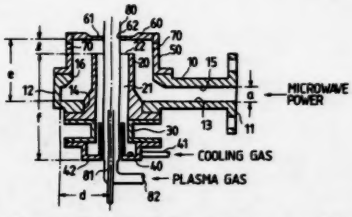
further said means breaking the continuity of a region of said one filament circuit i parallel with said coil upon establishment of plasma current through said tube whereby said coil is energized and all of said filament circuits are opened.

5,063,329

MICROWAVE PLASMA SOURCE APPARATUS

Yukio Okamoto, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 577,767
Claims priority, application Japan, Sep. 8, 1989, 1-231741
Int. Cl.[5] H05H *1/46*
U.S. Cl. 315—111.21 48 Claims



1. A microwave plasma source apparatus comprising:
a plane waveguide having an open end through which to introduce microwave power and an end plate located opposite to said open end;
a cylindrical coaxial waveguide having the central axis thereof located one quarter of the wavelength of said microwave power away from said end plate of said plane waveguide, an inner and an outer conductor of said cylin-

drical coaxial waveguide being coupled respectively with a bottom and an upper wall of said plane waveguide; and

a discharge tube located on the central axis of said inner conductor of said cylindrical coaxial waveguide.

5,063,330

PLASMA REACTOR

Philippe Leprince, Gif-sur-Yvette; Patrick Chollet, Les Ulis, and Serge Saada, Kremlin-Bicetre, all of France, assignors to Centre National De La Recherche Scientifique, Paris, France

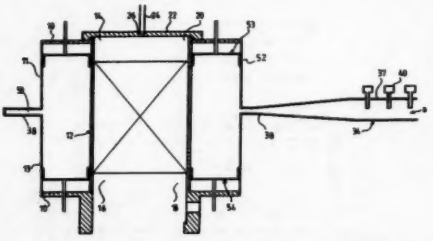
PCT No. PCT/FR89/00225, § 371 Date Jan. 7, 1991, § 102(e) Date Jan. 7, 1991, PCT Pub. No. WO89/11206, PCT Pub. Date Nov. 16, 1989

PCT Filed May 9, 1989, Ser. No. 601,818

Claims priority, application France, May 9, 1988, 88 06233

Int. Cl.[5] H05H *1/24*

U.S. Cl. 315—111.21 **15 Claims**



1. A plasma reactor comprising: a housing (10) capable of receiving a selected gaseous flow, a microwave generator (32) and wave guide means (34) for passing the microwaves to the housing (10) along a non-resonant coupling wherein the housing (10) does not dissipate, in the form of electromagnetic radiation, the ultrahigh frequency energy imparted thereto in the presence of gas, characterized in that, since the housing (10) is of a large size, the end portion (38) of the wave guide means is progressively reduced in one direction and widened in the other until it reaches a flat rectangular cross section completely surrounding the said housing (10) and produces a non-resonant coupling (50) therewith.

5,063,331

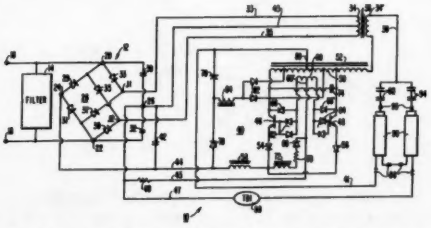
HIGH FREQUENCY OSCILLATOR-INVERTER CIRCUIT FOR DISCHARGE LAMPS

Allan A. Nostwick, Des Plaines, Ill., assignor to North American Philips Corporation, New York, N.Y.

Filed Jan. 4, 1991, Ser. No. 638,257

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—219 **18 Claims**



1. A high frequency oscillator-inverter circuit for starting and operating at least one electric discharge lamp from a low frequency AC signal of a given waveform produced by a power source, said signal crossing through a zero value to a maximum peak value, said circuit comprising:

rectifier means responsive to said AC signal applied at an input thereto for providing a fluctuating DC voltage at an output thereof;

means for receiving said at least one lamp including a frequency dependent impedance element for maintaining the flow of lamp current of a received lamp within given limits;

a power output transformer having a secondary winding and a primary winding;

circuit means including at least one semiconductor device and impedance means coupled to the transformer primary winding to form a resonant circuit which produces on said secondary winding a high oscillation operating frequency output voltage relative to the frequency of said AC signal in response to a DC voltage applied as an input thereto;

first power supply means including means responsive to said fluctuating voltage for generating a relatively smoother DC voltage from the fluctuating voltage and for applying the generated DC voltage to said circuit means; and

second power supply means coupled to said means for receiving and to said rectifier means responsive to a given voltage threshold for applying to said input and to said first power supply means during at least a portion of the AC signal cycle a signal manifesting the voltage of said AC signal smaller than said threshold level near the zero crossing of said AC signal such that the current waveform at said input induced by said circuit means approximately follows the AC signal voltage waveform at said input.

5,063,332

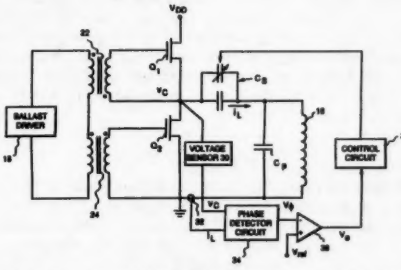
FEEDBACK CONTROL SYSTEM FOR A HIGH-EFFICIENCY CLASS-D POWER AMPLIFIER CIRCUIT

Sayed-Amr A. El-Hamamsy, and Joseph C. Borowiec, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1990, Ser. No. 631,836

Int. Cl.[5] H05B *41/24*

U.S. Cl. 315—248 **10 Claims**



8. A ballast for a high intensity discharge lamp of the type having an excitation coil situated about an arc tube for exciting an arc discharge in an ionizable fill contained in said arc tube, comprising:

a Class-D power amplifier including two switching devices coupled in series in a half-bridge configuration and having an output resonant circuit coupled at the junction between said two switching devices, said output resonant circuit including the inductance of said excitation coil coupled in series with a variable capacitance;

phase detecting means for detecting the phase angle between the output resonant circuit voltage and the output resonant circuit current and generating a voltage proportional to said phase angle;

comparator means for receiving the voltage proportional to said phase angle and comparing said voltage to a reference voltage and generating an error signal therefrom; and

control means for receiving said error signal and generating a control signal for varying the value of said variable capacitance in accordance therewith in order to maintain

said resonant circuit in tune and thereby maximize efficiency of said ballast.

5,063,333

DISCHARGE TUBE ARRANGEMENT

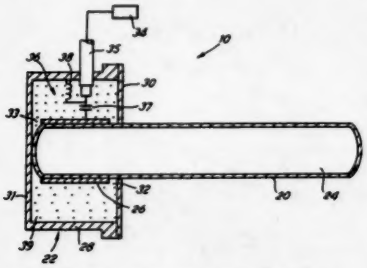
Neil A. Linden-Smith, and Andrew T. Rowley, both of Leicester, Great Britain, assignors to Thorn Emi plc, London, England

Filed Dec. 13, 1989, Ser. No. 448,128

Claims priority, application United Kingdom, Dec. 15, 1988, 8829251

Int. Cl.[5] H01J *19/80*

U.S. Cl. 315—326 **9 Claims**



1. A discharge tube arrangement comprising:

a launcher suitable, when energised with radio frequency (r.f.) power, for exciting surface waves in a discharge tube containing a fill, for producing a light output;

a discharge tube positioned in part within the launcher;

and an electrically conductive structure extending along the discharge tube, in use, said structure being connected to an earth wherein said structure is separated from the discharge tube by a radial distance such that, in use, said discharge tube produces an increase in total light output over the total light output of said discharge tube not having said structure, said structure positioned such that when in use it inherently intercepts the light output from the discharge tube and causes a reduction in total light output from the discharge tube, and wherein said structure has dimensions and is positioned such that, in use, said increase in total light output is greater than said reduction in light output caused by said structure obscuring said total light output.

5,063,334

ORTHOGONAL TWO-AXIS MOVING APPARATUS

Takeo Tanita, Kawasaki; Hiroyuki Kigami, and Yusaku Azuma, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 555,939

Claims priority, application Japan, Jul. 24, 1989, 1-188912; Jul. 24, 1989, 1-188913; Jul. 24, 1989, 1-188916; Sep. 28, 1989, 1-250562

Int. Cl.[5] B66C *23/16*

U.S. Cl. 318—568.10 **19 Claims**

1. An orthogonal two-axis moving apparatus comprising:

a first guide member which extends along a first direction and is attached to a stationary position;

a slide bock which is slidably supported on said first guide member and is moveable in the first direction;

a second guide member which extends along a second direction perpendicular to the first direction is supported by said slide block to be movable in the second direction;

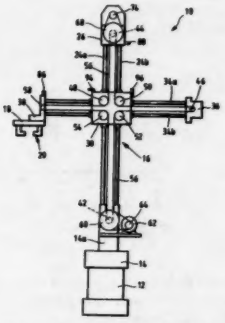
first and second rollers pivotally supported on two ends of said first guide member;

a third roller pivotally supported on a first end of said second guide member;

intermediate rollers pivotally supported on four corner portions of said slide block;

a coupling belt, two ends of which are fixed to a second end of said second guide member and which is looped in a cross shape on said first to third rollers and said four intermediate rollers;

first origin detection means for detecting an origin position of said slide block along the first direction; and



second origin detection means for detecting an origin position of said second guide member along the second direction.

5,063,335

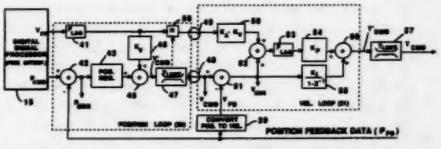
TWO-INPUT CONTROL WITH INDEPENDENT PROPORTIONAL AND INTEGRAL GAINS FOR VELOCITY ERROR AND VELOCITY FEEDFORWARD INCLUDING VELOCITY COMMAND LIMITING

Donald F. Baechtel, Lyndhurst; James E. Svarovsky, Sagamore Hills, both of Ohio, and Thomas Rehm, Mequon, Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 11, 1990, Ser. No. 580,708

Int. Cl.[5] G05B *11/36*

U.S. Cl. 318—609 **4 Claims**



1. In circuitry for controlling the velocity of a servomotor, in response to a motion command from other circuitry and in response to receiving position information which is fed back from an input device coupled to a servomotor, a servomotor control method comprising:

generating a position command from a processor in response to a motion command received by the processor;

algebraically summing the position command with position feedback derived from the position information to produce a position error result;

generating a velocity command in response to the position error result;

inputting the velocity command as a first input to circuitry operating as a proportional-integral velocity regulator;

generating a velocity feedforward command from the processor in response to the motion command received by the processor;

inputting the velocity feedforward command as a second input to the circuitry operating as the proportional-integral velocity regulator; and

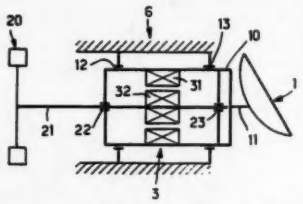
generating a command output from the proportional-integral velocity regulator to control the velocity of the servomotor in response to the first and second inputs to the circuitry operating as the proportional-integral regulator.

5,063,336

MECHANICAL STABILIZATION SYSTEM USING COUNTER-ROTATION AND A SINGLE MOTOR

Gérard Atlas, Saint Marcel, France, assignor to Societe Europeenne de Propulsion, Suresnes, France

Filed Jan. 26, 1990, Ser. No. 470,875
Claims priority, application France, Jan. 31, 1989, 89 01218
Int. Cl.[5] G05B *5/01*
U.S. Cl. 318—611 8 Claims



1. A mechanical stabilization system using counter-rotation and a single motor, the system comprising:

a support to be stabilized,

a working rotor mounted on the support by frictionless bearings and fixed to a working member for which at least one parameter associated with the rotation of the working rotor is variable as a function of time,

an electric motor for driving the working rotor,

a detector interposed between the working rotor and the support for measuring the parameter associated with the rotation of the working rotor on which a predetermined law of motion as a function of time is imposed,

a servo-control circuit receiving signals from the detector for modifying the operating characteristics of the motor so as to cause the working rotor to comply with the predetermined law of motion; and

a nested reaction rotor mounted concentrically with the working rotor by frictionless bearings, and supporting a reaction inertia member,

wherein the motor is interposed between the working rotor and the reaction rotor to rotate the working rotor and the reaction rotor in opposite directions such that the torque disturbances generated on the support by the motion of the working rotor are cancelled by the simultaneous reaction motion of the reaction motor, with the ratio of the speeds of the working rotor and the reaction rotor being such that the total angular momentum of the working rotor and the reaction rotor is maintained at zero.

5,063,337

ELECTRIC MOTOR REGULATION TO OBTAIN DESIRED SPEED CURVE

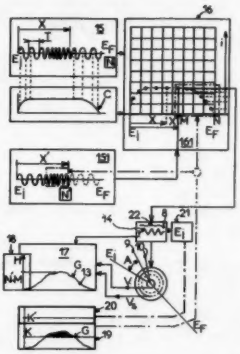
Jean Evin, Hameau de la Becque, Avelin 59710 Pontaillancq, France

PCT No. PCT/FR88/00198, § 371 Date Oct. 20, 1989, § 102(e) Date Oct. 20, 1989, PCT Pub. No. WO88/08477, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 22, 1988, Ser. No. 432,725
Claims priority, application France, Apr. 23, 1987, 87 05962
Int. Cl.[5] B66B *13/08*
U.S. Cl. 318—617 12 Claims

1. Method of regulating an alternating current electric motor having a rotor and connected to receive power from a power supply with an output which is variable depending on a predetermined speed reference (C) between two adjustable endmost angular positions (E_I and E_F) of the rotor spaced apart by an adjustable number of rotor revolutions and in which positions the speed is zero, this method comprising:

(A) initialization by the steps of: determining a theoretical number (N) of complete periods (T) of AC current (i) required for feeding the motor to drive the rotor over angular movement between the endmost angular positions (E_I and E_F), storing the theoretical number in a memory, storing a table having an output providing variations in the power supply to theoretically achieve the predetermined speed reference (c) based on a chronological position (x) of said complete periods (T) in the theoretical number (N), and

(B) operating the motor to provide the predetermined speed reference (c) by the steps of:



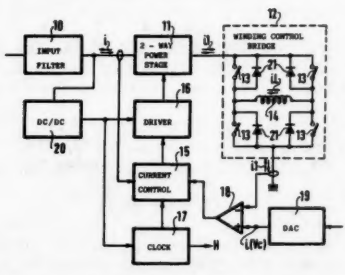
counting an instantaneous number (N') of complete periods of AC current from a first one of said endmost angular positions to a second one of said endmost angular positions, and controlling the power from the power supply to the motor by accessing the stored table based on the instantaneous number (N').

5,063,338

POWER MODULE FOR ELECTRONIC CONTROL OF A DC MOTOR

Antoine Capel, Ramonville, and Jean-Claude Marpinard, Toulouse, both of France, assignors to Alcatel Espace, Courbevoie, France

Filed Mar. 29, 1990, Ser. No. 501,223
Claims priority, application France, Mar. 30, 1989, 89 04167
Int. Cl.[5] G05B *19/40*
U.S. Cl. 318—685 3 Claims



1. A power supply module for electronic control of a pulse-operated motor, said module comprising, in succession:

an input filter providing an output;

a bidirectional current supply module delivering a voltage pulse of variable duration derived from a nonregulated voltage source and accompanied by a current of controlled amplitude;

a bridge stage having bidirectional switches and associated diodes, said bridge stage having first and second terminals each coupled to a pair of said switches, with diagonally opposite ones of said switches being simultaneously excited, said switchs being connected to one winding of said

motor, a current flowing in said winding being a parameter to be regulated by comparison with a sine wave type reference value;

a source of clock signals;

an error amplifier receiving a current reference value as one input and a current value from said bridge as another input;

a current control cell connected to the current supply module and receiving a signal from said clock, a signal from said output of said input filter, and a signal from said error amplifier;

a DC-DC converter connected to the output of the input filter for ensuring that auxiliary voltages and controlling clock signals are well distributed;

said current supply module generating a pulse of variable duration τ which is applied to said first bridge stage terminal for providing in said winding a triangular current waveform varying between a minimum value and a maximum value, which waveform, within each period, comprises first and second linear portions of opposite slope, the first portion having the form $(V-Vo)t/L$ during charging, and the second portion having the form $-(Vo)t/L$ during discharging, the amplitude of said triangular current being controlled by controlling said duration τ.

5,063,339

STEPPING MOTOR DRIVING DEVICE

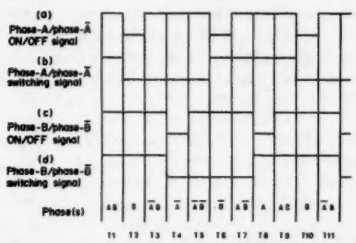
Akira Orii, and Haruhisa Watanabe, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 126,226

Claims priority, application Japan, Dec. 1, 1986, 61-284257

Int. Cl.[5] H02P *8/00*

U.S. Cl. 318—696 **4 Claims**



1. A drive device for driving a 4-phase stepping motor having a plurality of phase circuits including a plurality of windings, said phase circuits being arranged in phase circuit pair A,$\overline{A}$ and phase circuit pair B,$\overline{B}$ and said phase circuits having terminals electrically connectable and disconnectable to a power source to energize an A-phase/$\overline{A}$-phase, and a B-phase/$\overline{B}$-phase of the stepping motor, in response to logic signals including a high level signal and a low level signal supplied from a logically operated pattern generator circuit; first switching means connected to said pattern generator circuit and structured, in response to input of the high level logic signal of the pattern generator circuit, to electrically connect one of the terminals of the phase circuits to the power source, and, in response to input of the low level signal of the pattern generator circuit, to electrically disconnect said one terminal of the phase circuits from said power source; and second switching means selectively structured so that in response to input of the high level signal of said pattern generator circuit one of the phase circuits is closed so as to energize a member of the group consisting of one of the A-phase and the $\overline{A}$-phase, one of the B-phase and the $\overline{B}$-phase, and both one of the A-phase and the $\overline{A}$-phase and one of the B-phase and the $\overline{B}$-phase, while maintaining the other phase circuits in the phase circuit pairs A,$\overline{A}$ and B,$\overline{B}$, which have not been energized, nonenergized, and said second switching means being structured so that, in response to input of the low level signal of the pattern generator circuit, said one phase circuit is closed so as to deenergize said one of said A-phase and said $\overline{A}$-phase, one of the B-phase and the $\overline{B}$-phase and both one of the A-phase and the $\overline{A}$-phase and one of the B-phase and the $\overline{B}$-phase, while energizing the other phase circuits in the phase circuit pairs A,$\overline{A}$ and B,$\overline{B}$ which have not been deenergized, said second switching means also including a logic circuit having at least two switching elements arranged therein logically operated in response to the high and low level signals of said pattern generator circuit to selectively switch said phase circuits between an energized state and a deenergized state, one of said two switching elements including a buffer and the other including an inverter.

5,063,340

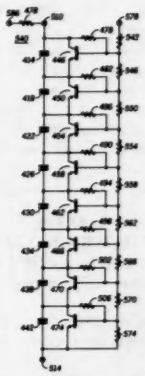
CAPACITIVE POWER SUPPLY HAVING CHARGE EQUALIZATION CIRCUIT

John A. Kalenowsky, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 25, 1990, Ser. No. 603,087

Int. Cl.[5] H02H *7/16*

U.S. Cl. 320—1 **26 Claims**



1. A portable, rechargeable power supply forming a power source of pre-defined characteristics for powering a load element when coupled thereto, said power supply having:

means forming a first conductive surface comprised of a conductive material for collecting and storing electrical charge responsive to application of a charging current thereto;

means forming a second conductive surface comprised of a conductive material and spaced-apart from the first conductive surface whereby a potential difference is formed between the first conductive surface and the second conductive surface when electrical charge is stored upon the first conductive surface, said first conductive surface and said second conductive surface spaced-apart therefrom together being of a low electrical resistance to minimize, thereby, resistive loss across the first and second conductive surfaces, respectively, during discharge of the electrical charge stored upon the first conductive surface to power the load element when coupled thereto;

a transistor network formed of at least one transistor having a first terminal connected to the first conductive surface and a second terminal connected to the second conductive surface; and

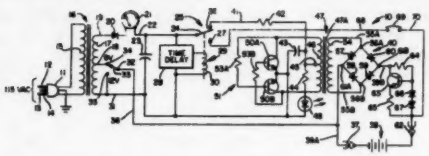
means for biasing the transistor to vary conductive characteristics thereof such that the transistor forms a shunt for reducing levels of the charging current applied to the first conductive surface when the potential difference formed between the first conductive surface and the second conductive surface is beyond a pre-determined value.

5,063,341

LEAD ACID BATTERY REJUVENATOR AND CHARGER

Carl E. Gali, 6414 Faircove Cir., Garland, Tex. 75043

Filed Oct. 16, 1990, Ser. No. 598,133
Int. Cl.[5] H02J 7/00, 7/02
U.S. Cl. 320—21 29 Claims



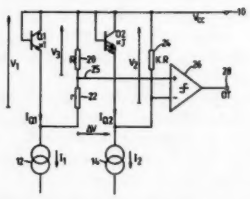
1. A combination rejuvenator and trickle charger for lead acid batteries comprising: AC power connection means: AC transference means; AC to DC conversion means; a DC to AC inverter multi-vibrator circuit connected to said AC to DC conversion means and to said AC transference means; a transformer with a primary coil a part of said DC to AC inverter multi-vibrator circuit, and having a secondary coil; a four diode recitfier bridge circuit having a first set of opposite terminals connected to said secondary coil, and a second set of opposite terminals; first connection means for connecting a first one of the terminals of said second set of bridge opposite terminals to a first terminal of a lead acid battery and second connection means for connecting the second of the terminals of said second set of bridge opposite terminals to the lead acid battery; one of said first and second connection means includes connection of terminal means of said second set of bridge opposite terminals through circuit means to a battery terminal connector.

5,063,342

TEMPERATURE THRESHOLD SENSING CIRCUIT

John B. Hughes, Hove, and Kenneth W. Moulding, Horley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1989, Ser. No. 401,729
Claims priority, application United Kingdom, Sep. 19, 1988, 8821910
Int. Cl.[5] G05F 3/22, 1/569
U.S. Cl. 323—315 20 Claims



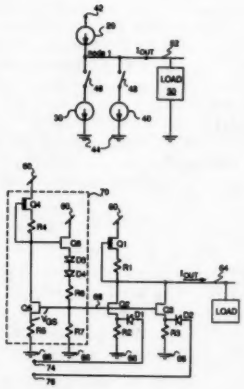
1. A temperature threshold sensing circuit comprising, first and second bipolar transistors formed together as part of an integrated circuit and biased so that the current density in the first transistor is larger than that in the second transistor by a first known factor, wherein said first and second transistors have their collectors connected to a first bias voltage source, their bases connected to a second bias voltage source and their emitters connected respectively to first and second current sources for passing first and second bias currents of known relative proportions through the first and second transistors, respectively and a voltage comparator connected to compare a first predetermined fraction of the base-emitter voltage of the first transistor with a second, larger predetermined fraction of the base-emitter voltage of the second transistor so that an output of the comparator adopts a first state when the temperature of the two transistors is above a known threshold temperature and adopts a second state when the temperature of the two transistors is below the known threshold temperature.

5,063,343

CURRENT PUMP STRUCTURE

Mark E. Fitzpatrick, San Jose, and Gary R. Gouldsberry, Cupertino, both of Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Filed Apr. 5, 1990, Ser. No. 506,418
Int. Cl.[5] G05F 3/08
U.S. Cl. 323—317 12 Claims



1. A circuit comprising:

a first current source means having a first terminal connected to a first reference level terminal and having a second terminal coupled to an output node;

a second current source means having a first terminal connected to said output node and having a second terminal connected to a second reference level terminal;

a third current source means having a first terminal connected to said output node and having a second terminal coupled to said second reference level terminal;

a first switch means operatively associated with said second current source means to cause said second current source means to change a current provided to said output node, wherein said first switch means is actuated by a first control signal; and

a second switch means operatively coupled to said third current source means to cause said third current source means to affect a current provided to said output node, wherein said second switch means is actuated by a second control signal.

5,063,344

MODE SELECTABLE INTERFACE CIRCUIT FOR AN AIR CORE GAGE CONTROLLER

Scott L. Linke, Flora, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 5, 1990, Ser. No. 488,567
Int. Cl.[5] G01R 15/08; H02K 11/00
U.S. Cl. 324—115 3 Claims

1. A serial interface circuit for driving an air core gage assembly, the circuit being capable of operating in a single chip mode or a host dependent mode, comprising:

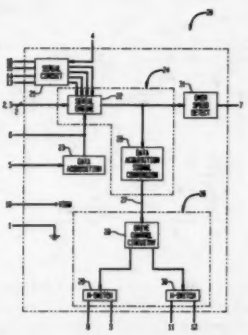
mode select means for selecting the single chip mode or the host dependent mode;

data acquisition means for acquiring signals pertaining to a parameter to be displayed;

control means including serial engine means for computing a gage displacement value based on the signals acquired by

said data acquisition means and a memory register for storing a gage displacement command;

serial circuit means effective when the single chip mode is selected to store the computed gage displacement value in said memory register, and when said host dependent mode is selected to store a remotely generated displacement value in said memory register;



signal conversion means for converting the gage displacement command stored in said memory register to air core gage assembly drive commands wherein the commands are provided on a serial communication channel; and

output means for driving the air core gage assembly in response to the commands received on the serial communication channel.

5,063,345

APPARATUS FOR DETERMINING A ROTATIONAL SPEED OF A VEHICLE WHEEL

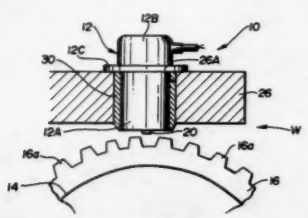
Takeo Akiyama, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 17, 1990, Ser. No. 583,275

Claims priority, application Japan, Oct. 19, 1989, 1-272319

Int. Cl.[5] G01P *3/48*

U.S. Cl. 324—173 **12 Claims**



1. A corrosion-resistant arrangement for mounting a wheel speed sensor for determining a rotational speed of a wheel of a vehicle, comprising:

a sensor rotor rotatable with a road wheel of the vehicle;

an installation member made of a material comprising aluminum as a major component and formed with an installation hole, said installation member being connected with the body of the vehicle;

a metallic sleeve fitted in the installation hole of said installation member, said metallic sleeve being plated at an outer surface with zinc to form a corrosion-resistant zinc film thereat, said zinc film being in direct contact with an inner surface of the installation hole; and

a sensor main body comprising means for producing a signal in response to a rotation of said sensor rotor, said sensor main body having a tip section and a cylindrical cover section and being fitted inside said metallic sleeve in such a manner that the tip end section is located in close proximity to said sensor rotor.

5,063,346

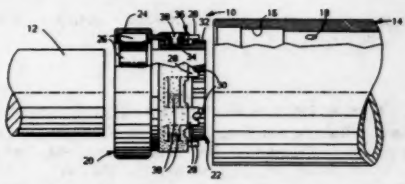
WHEEL SPEED SENSOR FOR REMOTE INSTALLATION

Martin J. Hogan, Sandusky, Ohio, and Martin A. Hogan, Farmington Hills, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 25, 1990, Ser. No. 542,614

Int. Cl.[5] G01P *3/44*; F16C *32/00*

U.S. Cl. 324—173 **3 Claims**



1. A speed sensor assembly adapted to be installed between a stationary housing having a cylindrical inner surface and a rotatable shaft disposed coaxially within said housing surface, comprising,

a generally cylindrical sensor ring having an interior surface sized to press fit non-turnably over said shaft and an exterior surface including a camming slot having a predetermined radial depth,

a generally cylindrical mounting sleeve sized to press fit non-turnably within said housing cylindrical surface, and,

an overcenter clutch member carried by said mounting sleeve which is shiftable from a first stable position in which it protrudes into said camming slot to a second stable position in which it rests clear of said slot when radially forced from said first stable position by said predetermined amount, said clutch member further being substantially inflexible in the axial direction,

whereby said sensor ring and mounting sleeve are retained together by said clutch member as a unit that can be installed by pushing said mounting sleeve into said housing cylindrical surface and by pushing said sensor ring over said shaft, by virtue of the axial inflexibility of said clutch member, after which said sensor ring may be freed from said mounting sleeve by turning said shaft and sensor ring, thereby forcing said camming slot into said clutch member and shifting it radially to said second stable position.

5,063,347

MAGNETIC SENSOR HAVING A BASE WITH MAGNETORESISTORS AND A MAGNET MOUNTED ON THE BASE

Yoshiharu Shigeno, Yokohama; Michihiro Murata, Kyoto; Yu Nishino, Ebina; Norio Fukui, Kyoto, and Keizou Yamamoto, Osaka, all of Japan, assignors to Murata Mfg. Co., Ltd., Nagaokakyo, Japan

Filed Mar. 23, 1990, Ser. No. 498,169

Claims priority, application Japan, Mar. 31, 1989, 1-38178[U]

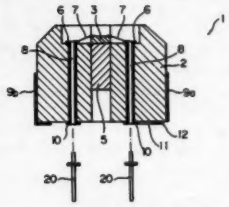
Int. Cl.[5] G01R *33/02, 33/12*; H01L *43/00*; G01N *27/72*

U.S. Cl. 324—235 **3 Claims**

1. In a magnetic sensor including a magnetic sensor element arranged on the upper surface of a base, and an input/output section provided on the lower surface of said base,

the improvement wherein said sensor element is comprised of a pair of serially connected magnetic resistances, a wiring pattern is formed on said base by electroless plating, and that said magnetic sensor element and said input-/output section are connected through said wiring pat-

tern, and further comprising a hole extending through said base and a magnet in said hole aligned with said magnetic



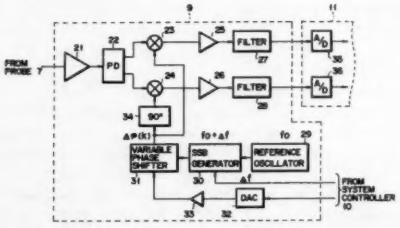
sensor element, said magnetic sensor having a nonmagnetic cover.

5,063,348

MAGNETIC RESONANCE IMAGING SYSTEM

Shigehide Kuhara, and Kozo Satoh, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1990, Ser. No. 484,048
Claims priority, application Japan, Feb. 23, 1989, 1-43504
Int. Cl.[5] G01V *3/00*
U.S. Cl. 324—307 **12 Claims**



1. A magnetic resonance imaging system for applying an RF field and slicing, phase encoding, and read-out gradient fields to an object to be examined which is placed in a homogeneous static field in a predetermined sequence, receiving a magnetic resonance signal from a region of interest in the object, causing a synchronous detection circuit to detect the magnetic resonance signal by using a predetermined reference wave, and sampling a detection output from said synchronous detection circuit, thereby acquiring magnetic resonance signal data and obtaining diagnostic data, said magnetic resonance imaging system comprising reference wave control means for shifting a frequency and phase of the reference wave, by predetermined amounts, from a frequency and phase of a magnetic resonance signal when the phase encoding and read-out gradient fields are zero.

5,063,349

TRANSFORMER-COUPLED GRADIENT SPEED-UP CIRCUIT

Peter B. Roemer, Schenectady; Otward M. Mueller, Ballston Lake; John N. Park, Rexford, and William McMurray, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

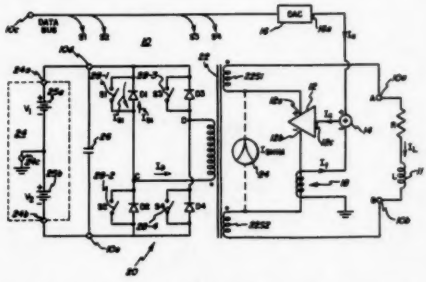
Filed Jun. 4, 1990, Ser. No. 533,233
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 **15 Claims**

1. A gradient speed-up circuit, for use in a higher-speed NMR imaging system having an associated gradient coil, comprising:

gradient power amplifier means for controlling a portion of a current flowing through an output circuit, responsive to an input signal;

transformer means having at least first and second secondary windings for connection of said amplifier means output circuit to said gradient coil, and having at least one primary winding coupled to said at least first and second secondary windings;

power switching means for providing a current flow through said primary winding to change the coil current responsive to a sequence of control signals; and



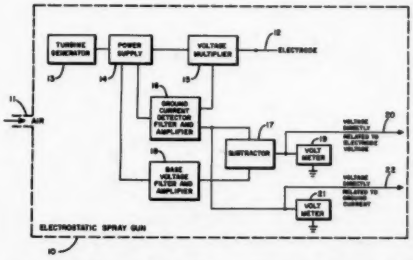
means for providing to said amplifier means the input signal with an amplitude changing the amplifier output circuit current whenever the coil current lags behind an amplitude commanded by a command signal.

5,063,350

ELECTROSTATIC SPRAY GUN VOLTAGE AND CURRENT MONITOR

Dale R. Hemming, Fridley; Lawrence J. Lunzer, St. Louis Park, and Robert J. Lind, Robbinsdale, all of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed Feb. 9, 1990, Ser. No. 478,277
Int. Cl.[5] G01R *29/12*
U.S. Cl. 324—457 **7 Claims**



1. An indicating device of the voltage and current on an electrostatic spray gun electrode which is supplied from a power supply within the gun, comprising

ground current sensing means detecting the ground current between the electrode and the power supply and producing a varying ground current voltage signal proportional to the varying ground current,

a control means establishing a base voltage from the power supply with a magnitude which is directly related to the source output voltage to the power supply,

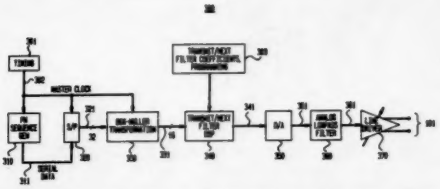
and subtracting circuit means subtracting the ground current voltage signal from the base voltage and producing an output indicator directly proportional to electrode voltage.

5,063,351

DIGITAL SIGNAL PROCESSING RELATING TO NEAR-END CROSSTALK CABLE MEASUREMENTS

Jeffery M. Goldthorp, Parlin, and James S. Yeomans, Morristown, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 24, 1990, Ser. No. 587,241
Int. Cl.[5] G01R *27/00, 23/16*
U.S. Cl. 324—628 18 Claims



1. Circuitry for testing a wire cable communication system including a system-under-test (SUT) utilizing a first set of wires, said circuitry generating an interference signal corresponding to at least one interference source utilizing a second set of wires, said circuitry comprising

means for digitally generating a discrete white noise source,

filter means for digitally filtering said noise source to produce said interference signal, said filter means having an input-to-output frequency transfer function characteristic representative of the combined spectra of the at least one interference source and a near-end crosstalk path between the first and second set of wires, and

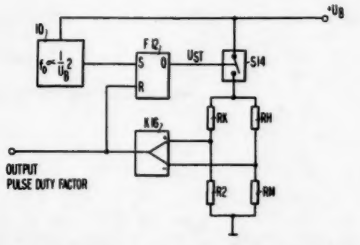
means for injecting the interfering signal into the SUT at a prescribed location along the first set of wires.

5,063,352

CIRCUIT ARRANGEMENT WITH A FLOW PROBE OPERATED IN A BRIDGE CIRCUIT

Josef Kleinhans, Vaihingen, Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE88/00761, § 371 Date Feb. 9, 1990, § 102(e) Date Feb. 9, 1990, PCT Pub. No. WO89/07242, PCT Pub. Date Aug. 10, 1989
PCT Filed Dec. 13, 1988, Ser. No. 473,949
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803609
Int. Cl.[5] G01R *27/08*
U.S. Cl. 324—706 9 Claims



1. Circuit arrangement with a flow probe connected in a bridge circuit which is power supplied by a source of operating voltage (U_B), comprising

a device for determining bridge balance;

an oscillator circuit controlled by the operating voltage (U_B) to deliver an operating frequency (f_o) which is at least approximately inversely proportional to the square of the operating voltage;

a triggering circuit controlled by the oscillator circuit and the bridge balance determining device to deliver control pulses (U_{ST}) whose duration (T_i) within time intervals (T_o) of respective cycles of the operating frequency (f_o) is a function (f(m)) of low rate sensed by the flow probe; and

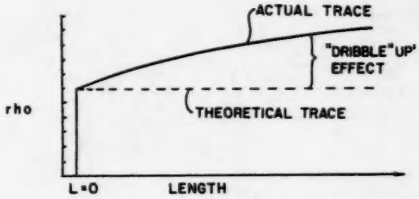
a switching device connected between the operating voltage source and the bridge circuit, the switching device being controlled by the control pulses (U_{ST}) to apply to the flow probe an average power which is independent of fluctuation of the operating voltage (U_B).

5,063,353

METHOD FOR ACCURATE MEASUREMENT OF TRANSMISSION LINE IMPEDANCE BY CORRECTING GROSS IMPEDANCE FOR THE "DRIBBLE-UP" EFFECT

Roland W. Gubisch, Lexington, Mass., assignor to Beckman Industrial Corporation, San Diego, Calif.

Filed Feb. 16, 1990, Ser. No. 480,782
Int. Cl.[5] G01R *31/08*
U.S. Cl. 324—710 14 Claims



1. A method for measuring the impedance of a transmission line comprising:

measuring the length and D.C. loop resistance of the line;

transmitting along the line a pulse having a pulse duration greater than the time required for it to propogate from its source to the end of the transmission line and reflect back to the source;

monitoring transmitted and reflected pulses and converting readings resulting therefrom to a gross impedance measurement; and,

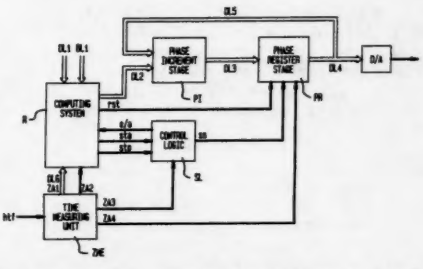
correcting the gross impedance measurement for the "dribble up" effect as a function of D.C. loop resistance in the transmission line, the corrected measurement being an accurate measurement of the line impedance.

5,063,354

FREQUENCY SYNTHESIZING DEVICE

Alfred Lauper, Zurich; Hanspeter Küpfer, Birmensdorf, and Daniel Rieder, Birmensdorf, all of Switzerland, assignors to Siemens-Albis Aktiengesellschaft, Zurich, Switzerland

Filed Dec. 20, 1989, Ser. No. 453,540
Claims priority, application Switzerland, Dec. 23, 1988, 04781/88
Int. Cl.[5] H03L *7/16*
U.S. Cl. 328—14 9 Claims



1. A method for the generation of periodic electrical oscilla-

tions at a frequency that can be arbitrarily determined, in which, after changing the frequency and resetting it to any desired value that has previously been generated, phase coherence is maintained, the method comprising the steps of: periodically counting a time interval from $t=0$ to $t=t_s$; computing in advance for a subsequent time $t_N (0<t_N<t_s)$ the starting phase ϕ_N of a new frequency f_N; and generating the frequency f_N from the time t_N with the starting phase ϕ_N.

5,063,355

TIMER CIRCUIT

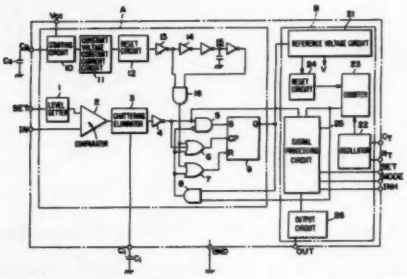
Kazuo Sasaki, Osaka; Hidetoshi Matsumoto, Kyoto, and Taneji Ohoka, Siga, all of Japan, assignors to Omron Corporation, Kyoto, Japan

Filed Mar. 9, 1990, Ser. No. 489,948

Claims priority, application Japan, Mar. 13, 1989, 1-60279

Int. Cl.[5] H03K *17/296;* **G04F** *15/00*

U.S. Cl. 328—129.1 **6 Claims**



1. A timer circuit comprising:

a first circuit block which is supplied with a source voltage at all times and comprising a memory circuit which is set when an input signal is applied thereto;

a second circuit block comprising a reference voltage circuit which outputs a reference voltage when said memory circuit is set and which ceases to output the reference voltage when said memory circuit is reset,

an oscillation circuit which outputs a train of pulse signals in a predetermined cycle,

a counter which starts counting said train of pulse signals when said reference voltage is outputted and which stops counting when a predetermined number of said pulse signals have been counted, and

a signal processing circuit which outputs a timer signal while said counter is counting;

wherein said reference voltage supplied by said reference voltage circuit is applied to power said second circuit block while the memory circuit remains set, wherein said memory circuit is reset in response to a time-out signal from said counter.

5,063,356

BALANCED FILTER CIRCUIT HAVING A CONTROLLABLE BALANCED CURRENT MULTIPLIER

Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 19, 1990, Ser. No. 585,341

Claims priority, application Netherlands, Sep. 29, 1989, 8902420

Int. Cl.[5] H03F *3/191*

U.S. Cl. 330—306 **13 Claims**

10. A balanced filter circuit which includes capacitance means and resistance means, said filter circuit comprising:

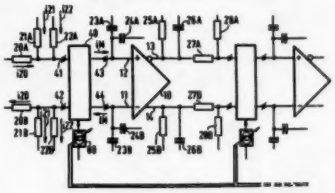
first and second signal input terminals,

first and second signal output terminals,

a balanced amplifier having an inverting input and a non-inverting input and furthermore an inverting output and a non-inverting output coupled to said first and second output terminals, respectively,

wherein said resistance means includes at least one pair of first and second filter resistors,

a controllable balanced current multiplier having first and second current inputs coupled to said first and second



filter resistors and to said first and second signal input terminals, respectively, and

means coupling first and second current outputs of said balanced current multiplier to the inverting input and the non-inverting input, respectively, of the balanced amplifier.

5,063,357

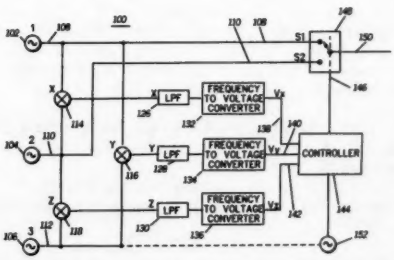
STABLE, RELIABLE OSCILLATOR SYSTEM USING AUTOMATIC OSCILLATOR SUBSTITUTION

William R. Williams, N. Lauderdale, and Edgar H. Callaway, Jr., Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Del.

Filed Aug. 3, 1990, Ser. No. 562,361

Int. Cl.[5] H03L *7/00*

U.S. Cl. 331—49 **10 Claims**



1. A high reliability and high stability oscillator circuit having an output, comprising:

at least three oscillators each providing oscillator signals;

at least three mixers each coupled to a pair of oscillators for mixing pairs of said oscillator signals to provide mixed signals; and

detector means responsive to said mixed signals for detecting frequency shift in any one of the oscillators;

switching means responsive to said detector means to provide one of said oscillator signals to the output of said oscillator circuit.

5,063,358

ULTRA LOW NOISE CRYSTAL OSCILLATOR CIRCUIT

Christopher R. Vale, Elk Ridge; Thomas S. Dominick, Glen Burnie; William R. Via, Dundalk, and Gene P. Knapp, Sr., Glen Burnie, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

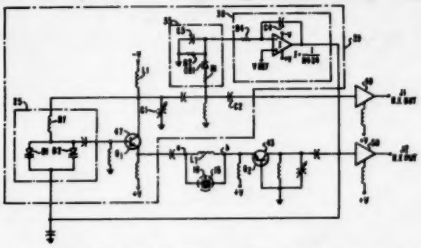
Filed Nov. 1, 1990, Ser. No. 608,069

Int. Cl.[5] H03B *5/36*

U.S. Cl. 331—60 **7 Claims**

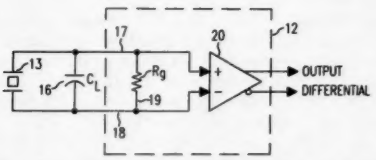
1. An ultra low noise oscillator circuit having first and second outputs comprising:

a crystal having first and second terminals;
heating means for heating said crystal;
an oscillator sustaining circuit having an output and having an input operatively connected to said first terminal;
a first amplifier having an output corresponding to the first



output of said oscillator circuit, and being operatively connected to said output of said oscillator sustaining circuit; and
a second amplifier having an output corresponding to the second output of said oscillator circuit, and being operatively connected to said second terminal.

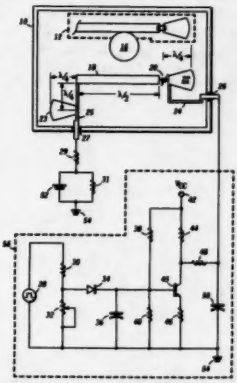
5,063,359
LOW-JITTER OSCILLATOR
Robert H. Leonowich, Temple, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Nov. 15, 1990, Ser. No. 614,325
Int. Cl.[5] H03B *5/36*
U.S. Cl. 331—116 FE **11 Claims**



1. In an electronic system, an oscillator CHARACTERIZED BY:
a resonator having two terminals;
a means for generating a negative resistance, coupled to the terminals of the resonator; and,
a comparator, having two inputs coupled to corresponding terminals of the resonator, and having at least one output;
wherein the output of the of the comparator is a signal having a frequency substantially determined by the resonator.

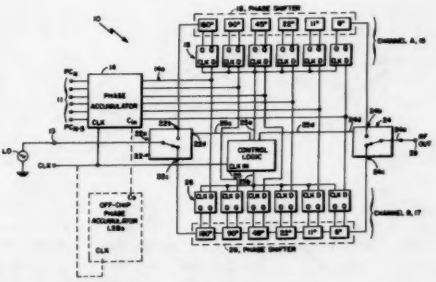
5,063,360
PULSE REPETITION FREQUENCY PUSHING COMPENSATION CIRCUIT
Bernard E. Sigmon, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 4, 1991, Ser. No. 663,505
Int. Cl.[5] H03B *5/04, 5/18, 7/12;* **H03L** *1/02*
U.S. Cl. 331—175 **20 Claims**

1. A frequency-pushing compensation circuit for a pulsed source with a pulse repetition frequency (PRF)-induced frequency shift, comprising:
pulsed source means;
frequency compensation means coupled to the pulsed source means; and
pulse bias amplification means coupled separately to the pulsed source means and to the frequency compensation means, the pulse bias amplification means producing a



feedback compensation signal to the frequency compensation means to reduce the PRF-induced frequency shift.

5,063,361
SERRODYNE MODULATOR
Irl W. Smith, Concord, and Manfred J. Schindler, Newton, both of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Dec. 21, 1990, Ser. No. 633,558
Int. Cl.[5] H04L *27/00*
U.S. Cl. 332—103 **6 Claims**



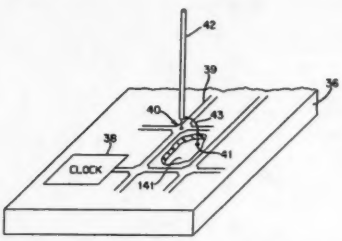
1. A direct digital synthesizer comprising:
phase accumulator means fed by a control word for computing a desired phase word whose time rate of change is proportional to a desired output frequency of the direct digital synthesizer; and
a radio frequency phase shifter having an RF input port, and RF output port, and a control port which controls the relative phase difference between an input signal fed to the input and output signal provides from the output with said phase word being fed to said control port and said relative difference being related to the phase word provided from said phase accumulator means.

5,063,362

SUPPRESSION OF ELECTRICAL INTERFERENCES FROM AN ELECTRONIC CIRCUIT

Philip A. Herman, Hyde Park, and William F. McCarthy, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1990, Ser. No. 519,528
Int. Cl.[5] H04B 3/28
U.S. Cl. 333—12 13 Claims



10. An apparatus for suppression of EMI radiations comprising:

an electronic circuit having a node which acts as an antenna emitting radiations to be suppressed, said node having separate electrical components electrically insulated from one another;

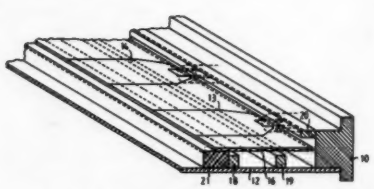
a stub member having a first conductor connected to one of said separate electrical components, and a second conductor connected to another of said separate electrical components, said stub member forming a resonant transmission line for suppressing said EMI radiations.

5,063,363

ELECTROMAGNETIC ENERGY RADIATION PICK-UP

Hervé Coppier, Noyon; Jean-Louis Pourailly, Vincennes, and Joseph Roger, Bures sur Yvette, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Jun. 29, 1990, Ser. No. 546,380
Claims priority, application France, Jul. 7, 1989, 89 09175
Int. Cl.[5] H01P 5/08
U.S. Cl. 333—33 5 Claims



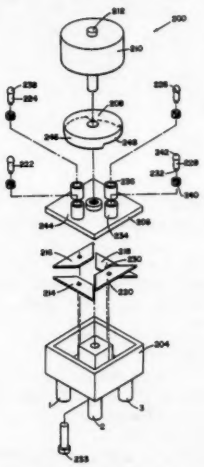
1. A pick-up for electromagnetic energy radiation guided between at least two parallel ground plates, said pick-up including a plane conductive tongue positioned between the two ground plates in a plane parallel to these plates and pointed in the direction of propagation of the guided electromagnetic energy, said plane conductive tongue being electrically unconnected to the parallel ground plates, and obstacles interposed between the ground plates and the tongue converting the electromagnetic energy guided between the two ground plates, propagated in the transverse electromagnetic mode, into an electromagnetic energy that is propagated in the transverse asymmetrical electromagnetic mode in a strip line structure formed by the tongue and the two ground plates, and wherein the obstacles are conductive strips that are positioned against the ground plates, facing the conductive tongue, and oriented perpendicularly to the direction in which the guided electromagnetic energy is propagated.

5,063,364

C-, T- AND S-SWITCHES THAT ARE MECHANICALLY OPERATED BY A ROTARY ACTUATOR

Paul Y. Tsoi, Waterloo, Canada, assignor to Com Dev Ltd., Cambridge, Canada

Filed May 2, 1990, Ser. No. 517,686
Claims priority, application Canada, Apr. 12, 1990, 2014584
Int. Cl.[5] H01P 1/12
U.S. Cl. 333—107 14 Claims



1. A microwave switch comprising an RF cavity housing, an actuator and power means for repositioning said actuator arranged as follows:

(a) said housing having at least two conductor paths interconnecting at least three ports, said housing also containing at least two pins, each pin having a separate connector thereon, one connector being located in each conductor path, each connector having two positions that are linearly displaced from one another;

(b) each connector connecting the conductor path in one position and interrupting the conductor path in another position;

(c) said housing having one opening therein for each pin, each opening being large enough for a pin to be spring-mounted therein, each pin being spring-mounted and having one end which is attached to that connector that is located immediately adjacent to that opening, said pin having another end being a free end, said free end being located outside of said housing when said pin is released, said spring-mounting tending to force said free end of said pin away from said housing, each pin having two distinct positions, a depressed position and a released position;

(d) said actuator being a rotary cam mounted outside said housing and connected to said power means so that said power means can rotate said cam to at least two predetermined positions, said cam having at least one ridge and at least one indentation located thereon, said at least one ridge and said at least one indentation being located so that when a ridge overrides a pin, said pin being depressed and when an indentation overrides a pin, said pin is released, said ridge and said indentation overriding said pins as said cam rotates;

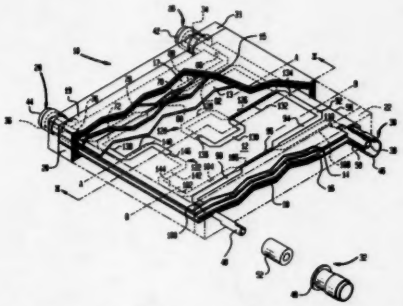
said at least one ridge and said at least one indentation being co-ordinated with said power means so that appropriate conductor paths are connected and interrupted substantially at the same time, the cam, the power means, the springs, the pins and the connectors being the only movable components of the switch.

5,063,365

MICROWAVE STRIPLINE CIRCUITRY

Joseph D. Cappucci, Wayne, N.J., assignor to Merrimac Industries, Inc., West Caldwell, N.J.

Filed Aug. 25, 1988, Ser. No. 236,657
Int. Cl.[5] H01P 5/20
U.S. Cl. 333—121 10 Claims



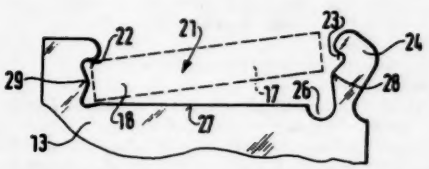
1. A broad band stripline magic tee designed for a center microwave frequency, comprising first and second 3db quadrature couplers each having a first port, a second port, a third port, and a fourth port; and a non-reflective, non-adjustable 90° differential phase shift circuit interconnecting said first and second couplers, said phase shift circuit including first and second conductors therein having apparent electrical lengths at said center microwave frequency that differ from one another by 270°, said second port of said first coupler being serially connected through said first conductor to said first port of said second coupler, said third port of said first coupler being serially connected through said second conductor to said fourth port of said second coupler, said first and fourth ports of said first coupler and said second and third ports of said second coupler serving as respective pairs of input and output ports of said magic tee, whereby the application of a microwave input signal within said band to one of said input ports results in output signals at said output ports that are of substantially equal amplitude and substantially in phase with one another, and the application of said microwave input signal to the other of said input ports results in signals at said output ports that are of substantially equal amplitude and substantially 180° out of phase with one another, said magic tee having left-to-right symmetry and being reversible in operation.

5,063,366

ELECTROMAGNETIC RELAY

Erhard Edelhaeuser, Ansbach; Hans-Dieter Schmid; Ludwig Speckner, both of Nuremberg; Karl Wutz, Neumarkt, and Horst Steffen, Schwarzenbruck, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 29, 1990, Ser. No. 529,907
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1989, 8909467[U]
Int. Cl.[5] H01H 67/02; H01F 7/08
U.S. Cl. 335—271 1 Claim



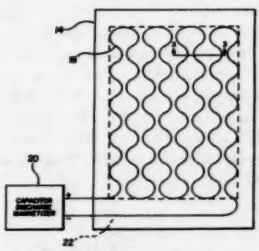
1. An electromagnetic relay comprising core, a relay winding on the core, an L-shaped magnetic yoke connected at one end thereof to the core, an armature assembly including an armature plate attached to a flat biasing spring, the armature assembly being hinged in a recessed support stamped out at the other end of the yoke; the recessed support being delimited by a bottom surface and two lateral projections extending from the bottom surface, each lateral projection having at its free end a shoulder engaging the armature assembly to prevent jarring impacts on the spring; a switching contact arranged on a free end of the spring; at least one fixed contact arranged opposite the switching contact; and at least one of the two projections having constricted region for permitting the bending of the projection between an open condition at which a corresponding shoulder is remote from the armature assembly, and a closed condition at which the shoulder overlaps the armature assembly, the constricted region being a trough-shaped cutout provided in a corner between one of the projections and the bottom surface of the recess, the respective lateral projections having inner walls formed with boundary surface portions for guiding opposite lateral sides of the armature assembly within the recess, the boundary surface portions having an arcuate configuration with rounded edges.

5,063,367

METHOD AND APPARATUS FOR PRODUCING COMPLEX MAGNETIZATION PATTERNS IN HARD MAGNETIC MATERIALS

J. Kelly Lee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 4, 1990, Ser. No. 576,753
Int. Cl.[5] H01F 7/20, 13/00; G08B 13/24, 13/14
U.S. Cl. 335—284 8 Claims



1. Apparatus for producing a complex magnetization pattern in a sheet of magnetic material, comprising:

a magnetizing fixture having top and bottom plates, the top and bottom plates each having a conductor embedded in one surface thereof, the conductors forming matching folded serpentine patterns covering substantially the entire surface of the plate, in operation the sheet of magnetic material being placed between said top and bottom plates adjacent said folded serpentine conductor patterns; and

capacitor discharge magnetizing circuit means connected to the conductors for delivering a magnetizing pulse of current to the conductors.

6. A method of producing a complex folded serpentine magnetic pattern in a sheet of magnetic material suitable for use in a magnetic target demagnetizer, comprising the steps of:

(a) providing a magnetizing fixture having top and bottom plates, each having a conductor embedded in one surface thereof;

(b) placing a sheet of magnetic material between the plates of the magnetizing fixture; and

(c) applying a magnetizing current to the conductors employing a capacitor discharge magnetizer.

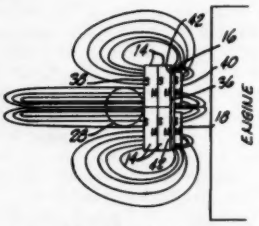
8. A magnetic article formed according to the steps of claim 6.

5,063,368

MAGNETIC ASSEMBLY FOR ENHANCING FUEL COMBUSTION

Reza Ettehadieh, 215 S. LaCienega Blvd., No. 101, Beverly Hills, Calif. 90211

Filed Dec. 18, 1990, Ser. No. 629,438
Int. Cl.[5] H01F *7/00, 7/02;* **B01D** *35/06;* **F02M** *27/00*
U.S. Cl. 335—301 **10 Claims**



5. A magnetic assembly adapted to be secured to a fuel line of a motor vehicle for improving the combustion of the fuel passing through the line, said assembly comprising:

a housing having a top, bottom and side walls;

means carried by said housing for securing said assembly to the fuel line such that said bottom wall is disposed against the fuel line;

a plurality of primary magnets disposed within said housing and arranged in two adjacent columns with at least two primary magnets in each column and the south poles of each primary magnet facing toward said bottom wall of said housing;

a substantially flat plate disposed within said housing against the north poles of the two uppermost magnets in said columns; and

four secondary magnets disposed against said plate on the opposite side thereof from said primary magnets and adjacent said top wall of said housing, said secondary magnets being substantially weaker in magnetic strength then said primary magnets and two of said secondary magnets being aligned over each column of said primary magnets with the south poles of said secondary magnets being disposed against said plate.

5,063,369

AUTO THEFT ALARM

Alfonso Aguilar, 904 Bolivia, El Paso, Tex. 79903

Filed Jul. 27, 1990, Ser. No. 563,302
Int. Cl.[5] B60R *25/10*
U.S. Cl. 340—429 **3 Claims**

1. A fail safe auto theft alarm system, comprising:

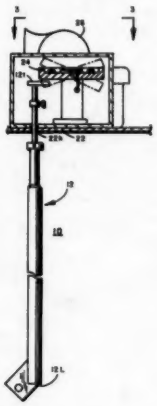
a rod having a top and a lower end;

rod to shock absorber coupling means coupling the lower end of the rod to a rear shock absorber of an auto wherein the auto has a trunk having a bottom surface;

a sound maker;

the bottom surface of the auto trunk defines a hole therethrough through which hole the top of the rod is coupled to a switch means that actuates the sound maker, and the rod is coupled to the shock absorber by shock absorber coupling means, the switch means comprising two switches in series, a first switch and a second switch, the rod is moved up and down by motion of the shock absorber when the auto is moving, so that movement of the rod up and down causes the first switch of the switch means to close, thereby permitting activation of the sound marker only if the second switch is also closed, and wherein the second switch is opened and closed manually to activate and deactivate the fail safe auto theft alarm system; and

a power source capable of generating power which power is transmitted through the two switches of the switch means



when both switches are closed to activate the sound maker.

5,063,370

HYPODERMIC SYRINGE NEEDLE DETECTION ALARM

Steven C. Smith, 2315 N. Pearl #10-185, Tacoma, Wash. 98406

Filed May 10, 1990, Ser. No. 521,678
Int. Cl.[5] G08B *21/00;* **H01H** *47/00*
U.S. Cl. 340—540 **20 Claims**

1. A hypodermic syringe needle detection device comprising two layers of permeable electrically conductive material which is susceptible to puncture by a hypodermic syringe needle separated by permeable electrically non-conductive material which is susceptible to puncture by a hypodermic syringe needle, a means to provide electrical connection from one pole of a two pole direct current power source to pole one of a two pole alarm; a means to provide electrical connection from pole two of said two pole alarm to the second layer of said two layers of electrically conductive material; a means to provide electrical connection from the first layer of said two layers of electrically conductive material to a second pole of said two pole direct current power source; and a means to hold said device together in a portable case.

5,063,371

AIRCRAFT SECURITY SYSTEM

Michael W. Oyer, 124 Stony Gate, Carlisle, Mass. 01741, and Algird M. Gudaitis, 13 Evelyn Rd., Stow, Mass. 01775

Division of Ser. No. 913,139, Sep. 29, 1986, Pat. No. 4,933,668.
This application Dec. 22, 1989, Ser. No. 455,246
Int. Cl.[5] G08B *13/00*
U.S. Cl. 340—541 **14 Claims**

1. An aircraft security system comprising:

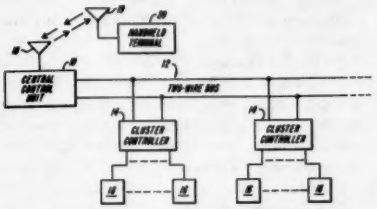
an onboard computer;

one or more cluster controllers remotely located from said onboard computer;

a plurality of sensors associated with and controlled by each of said cluster controllers, each of said sensors generating a sensor signal in response to sensing a security condition;

means for communication between said onboard computer and said cluster controllers, each of said cluster controllers transmitting said sensor signal to said onboard computer for generation of a security indication; and

said onboard computer including means for storing type information and operating parameters for each of said



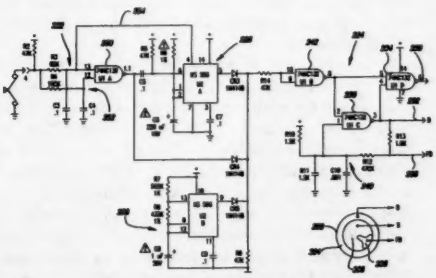
plurality of sensors and for transmitting the type information and the operating parameters to the associated cluster controller when said system is to be put into operation, said type information and operating parameters identifying the type and operating characteristics of each of said sensors.

5,063,372

DOOR AJAR ALARM FOR REFRIGERATION UNIT

Jimmie D. Gillett, Garland, Tex., assignor to Ranco Incorporated of Delaware, Wilmington, Del.

Filed Jun. 22, 1990, Ser. No. 542,270
Int. Cl.[5] G08B *13/08*
U.S. Cl. 340—547 **8 Claims**



1. An alarm system for signalling when a door of a refrigeration unit compartment is not fully closed comprising:

a. an alarm condition sensing means comprising;

i. a narrow elongated door sealing gasket magnet producing a narrow magnetic field for coupling the door to at least part of the unit extending about the compartment opening when the door is fully closed, said magnet supported by said unit within a tolerance band which is wider than the width of said magnet; and,

ii a magnetically responsive switch actuated to a first condition by the magnetic field when the door is fully closed, said switch maintained in a second condition when the door is away from the fully closed position; and,

b. an alarm signalling means for producing an alarm signal when said switch is in said second condition;

c. said switch comprising

i. a stationary contact having first and second contactors spaced apart in a direction transverse to the magnetic field when the door is fully closed;

ii. a movable elongated contact pad having first and second contacts spaced apart in said direction and each positioned for engagement with a respective one of said first and second contactors;

iii. first resiliently deflectable spring means supporting said first contact for movement toward and away from said first contactor, said first spring means deflected to produce contact between said first contact and said first contactor when said door is fully closed and the gasket magnet is at one extreme of said tolerance band; and,

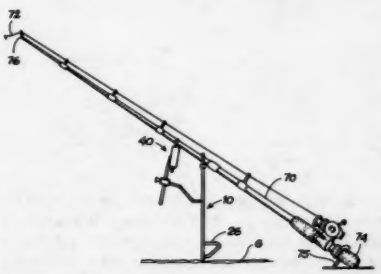
iv. second resiliently deflectable spring means supporting said second contact for movement relative to said first contact toward and away from said second contactor, said second spring means deflected to produce contact between said second contact and said second contactor when said door is fully closed and the gasket magnet is supported at the opposite extreme of said tolerance band.

5,063,373

FISHING ROD HOLDER WITH FISH ALERT

George R. Lindsley, 632 Calle Zapata, Tucson, Ariz. 85745

Filed Oct. 25, 1990, Ser. No. 603,156
Int. Cl.[5] G08B *23/00*; A01K *85/01*
U.S. Cl. 340—573 **16 Claims**



1. A fishing rod holder incorporating an alarm to alert a user of an increase in the tension of the fishing line, comprising:

(a) a support structure, consisting of a rod having a pointed bottom end for insertion into the ground and having a brace at its top end for receiving and supporting the blade of a fishing rod resting against said brace;

(b) sensor means, mounted on said support structure and adjustably in contact with the forward portion of said fishing rod, for sensing a pulling force on said forward portion of the fishing rod caused by a striking fish; and

(c) alarm means, actuated by said sensor means, for alerting said user of the pulling force on said fishing rod;

wherein said support structure further comprises a foot rest, projecting out perpendicularly from said rod to create a foothold by which said holder can be pushed into the ground, and a side arm, projecting out and generally upward from said rod in the direction opposite to said foot rest to adjustably support said sensor means.

5,063,374

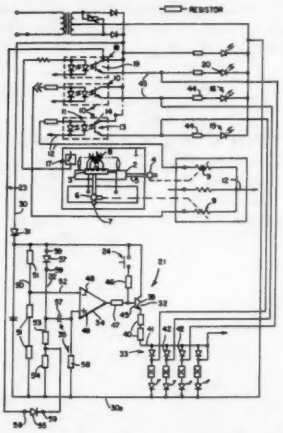
SIMULTANEOUS SIGNAL DEVICES TESTING IN RESPONSE TO PERIODIC FUNCTION OF AN OPERATING DEVICE IN A SYSTEM

John J. Deisinger, Wauwatosa, Wis., assignor to A. O. Smith Corp., Milwaukee, Wis.

Continuation of Ser. No. 400,466, Aug. 29, 1989, abandoned. This application Jan. 8, 1991, Ser. No. 637,925
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—642 **8 Claims**

5. A circuit test system for testing a plurality of selectively actuated signal devices in a monitoring circuit for monitoring operation of various operating devices in an operating system including a demand signal input for supplying a demand signal for operating at least one of said various operating devices, each signal device providing a generally corresponding known output, said circuit test system comprising control means operable to simultaneously energize all of said signal devices, a

reference voltage dividing circuit establishing a reference signal, a control voltage dividing circuit including a first resistor and a second resistor connected in series for establishing a control signal, a comparator having an output and having a first input connected to said reference voltage dividing circuit and said reference signal and having a second input connected to said control voltage dividing circuit for selectively driving



said comparator on in response to said control signal having a selective relationship to the reference signal at said first input a demand signal line connecting said control voltage dividing circuit and establishing said control signal in response to said demand signal, said control means connected to said output of said comparator, and means to selectively open and close said control voltage dividing circuit to selectively connect said demand signal to said comparator.

5,063,375

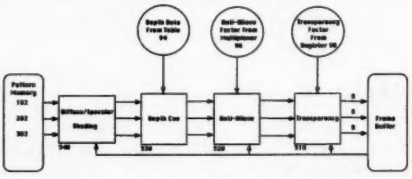
METHOD AND APPARATUS FOR SHADING IMAGES

Sheue-Ling Lien, Mountain View; Michael J. Shantz; Susan E. Carrie, both of Sunnyvale; Jim V. Loo, Los Altos, and David Elrod, Sunnyvale, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 77,797, Jul. 27, 1987, abandoned. This application Sep. 18, 1989, Ser. No. 409,262

Int. Cl.[5] **G09G** *1/28*

U.S. Cl. 340—703 **22 Claims**



1. An apparatus for generating shading values of graphic objects for display at a predetermined location on a graphics display device, said graphic objects comprising vectors, curves, polygons and patches, each graphic object defined by graphic object pixel data initially comprising a representation of the color of the graphic object, said graphic object shaded according to a light source, said device comprising a central processing unit (CPU), memory, a frame buffer and a display device which displays the pixel data stored in the frame buffer, said apparatus comprising:

means for modifying the graphic object pixel data according to specular and diffuse functions to include specular and diffuse shading values for the graphic object,

said specular function determined from specular shading scan line values, an object specular exponent for the graphic object and a surface normal vector for the graphic object, said specular shading scan line values being determined according to the dot product of the surface normal vector and unit vector in the direction of maximum highlight,

said diffuse function determined from diffuse shading scan line values, a coefficient of ambient reflection of the graphic object, the surface normal vector for the graphic object, a pattern memory relevant to the graphic object, said diffuse shading scan line values being determined according to the dot product of the surface normal vector and a unit vector in the direction of the light source;

means or modifying the graphic object pixel data to produce a depth cue effect according to a depth cue function, said depth cue function determined for a depth cue color for the graphic object, said background color and the graphic object pixel data;

means for modifying the graphic object pixel data to produce an anti-aliase effect according to an anti-aliase function, said anti-aliase function determined from a modified Bresenham error function, and the pixel data read from the frame buffer located at the predetermined location the graphic object is to be displayed;

means for modifying he graphic object pixel data to produce a transparency effect according to a transparency function, said transparency function determined from a transparency coefficient for the graphic object, pixel data read from the frame buffer located at the predetermined location the graphic object is to be displayed and the graphic object pixel data;

means for organizing the means for modifying the graphic object pixel data according to specular and diffuse functions, means for modifying ht graphic object pixel data to produce an anti-aliase effect, means for modifying the graphic object pixel data to produce a depth cue effect and means for modifying the graphic object pixel data to produce a transparency effect in a pipeline structure, said pipeline structure comprising means which serially connect said means for modifying the graphic object pixel data according to specular and diffuse functions, means for modifying the graphic object pixel data to produce an anti-aliase effect, means for modifying the graphic object pixel data to produce a depth cue effect and means for modifying the graphic object pixel data to produce a transparency effect such that the output of one means is connected to the input of another means, the first means connected in the pipeline structure having unmodified graphic object pixel data as one of its input and the last means connected in the pipeline being input to he frame buffer and having as its output the modified pixel data a reflective of a shaded image of the graphic object;

means for the CPU to selectively enable said means for modifying the graphic object pixel data according to specular and diffuse functions, means for modifying the graphic object pixel data to produce an anti-aliase effect, means for modifying the graphic object pixel data to produce a depth cue effect and means for modifying the graphic object pixel data to produce a transparency effect according to the type of graphic object the graphic object pixel data defines; and

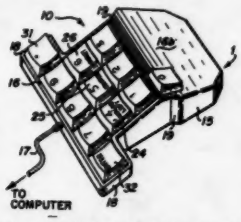
means for the frame buffered to receive the output of the last means connected in the pipeline structure and the frame buffered for subsequent display of the shaded image of the graphic object.

5,063,376

NUMERIC MOUSE ONE HAND CONTROLLABLE COMPUTER PERIPHERAL POINTING DEVICE

Ronald G. Chang, 1124 Wonderlich Dr., San Jose, Calif. 95129

Filed May 5, 1989, Ser. No. 348,062
Int. Cl.[5] G09G 5/00
U.S. Cl. 340—706 27 Claims



1. A one hand controllable computer peripheral pointing device for selecting and controlling a portion of a computer screen display and for input to a mouse-based computer program comprising in operative combination:

(a) a housing, said housing being:

(i) sized to enclose means for on-screen pointing functioning of said pointing device; and

(ii) adapted to be held by one hand;

(b) said housing having at least one first surface;

(c) at least one finger-actuable button disposed on said first surface, each of said finger-actuable button being positioned on said pointing device for convenient and efficient actuation by one or more fingers of one of a user's hands while said pointing device is being controlled by said hand; and

(d) an analog switch, disposed in association with at least a first one of said finger-actuable buttons, said analog switch and associated finger-actuable button having dual function mode capability including:

(i) a first function mode for use as a selection mechanism; and

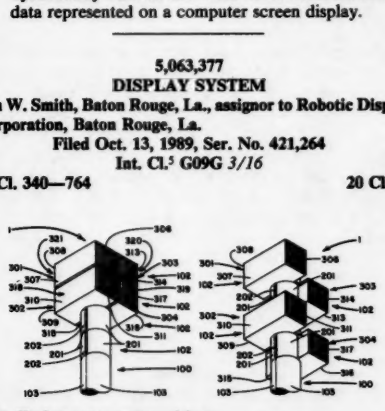
(ii) a second function mode for inputting to a computer a signal corresponding to the depth that said button is directly actuated by fingers of said user's one hand to dynamically control the value of an attribute of input data represented on a computer screen display.

5,063,377

DISPLAY SYSTEM

Glenn W. Smith, Baton Rouge, La., assignor to Robotic Displays Corporation, Baton Rouge, La.

Filed Oct. 13, 1989, Ser. No. 421,264
Int. Cl.[5] G09G 3/16
U.S. Cl. 340—764 20 Claims



1. A display system comprising:

a. a shaft means, for supporting said display system:

b. a plurality of carriage means, positioned on said shaft means such that carriage means are each independently movable circumferentially around said shaft means to independent positions;

c. a plurality of motorized circumferential motive means, each said circumferential motive means connected to one said carriage means, for independently moving said carriage means circumferentially about said shaft means, each said circumferential motive means and connected said carriage means forming an independently movable unit; and

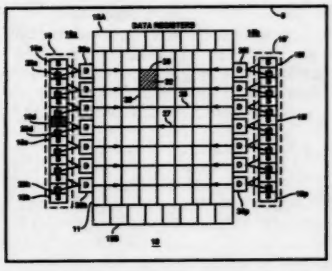
d. a plurality of visual elements, each said visual element connectable to one said carriage means.

5,063,378

SCANNED LIQUID CRYSTAL DISPLAY WITH SELECT SCANNER REDUNDANCY

William R. Roach, Rocky Hill Borough, Somerset County, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Dec. 22, 1989, Ser. No. 455,191
Int. Cl.[5] G09G 3/18
U.S. Cl. 340—784 9 Claims



1. In a scanned active matrix display including an array of selectable pixel cells arranged in a matrix having in a plurality of rows and a plurality of columns, wherein each pixel cell is addressed by selecting one of said rows of pixel cells and one of said columns of pixel cells, apparatus for redundantly selecting individual rows of pixel cells comprising:

shift register means having a plurality of stages, each coupled to a respectively different row of pixel cells, for successively applying a first select signal to each row of pixel cells;

alternate select means for successively applying a second select signal to each row of pixel cells; and

a plurality of combiner means, coupled to said plurality of stages of said shift register, respectively, and to said alternate select means for selectively applying said first select signal or said second select signal to the respective next stages of said shift register.

5,063,379

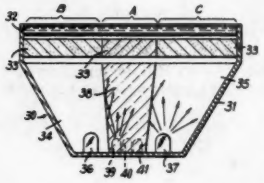
LIQUID CRYSTAL INDICATOR, PREFERABLY FOR MOTOR VEHICLES

Ehrenfried Fabry, Nürnberg; Georg Goddard, Wendelstein; Dieter Meyer, Feucht; Hans Petermann; Bernhard Pirkl, both of Nürnberg, and Werner Wiedemann, Herzogenaurach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00373, § 371 Date Apr. 21, 1989, § 102(e) Date Apr. 21, 1989, PCT Pub. No. WO88/03663, PCT Pub. Date May 19, 1988
PCT Filed Aug. 21, 1987, Ser. No. 347,776
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639008
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] G09G 3/36
U.S. Cl. 340—784 8 Claims

1. A display device for measured values, functions, status, and trouble indications and comprising at least one liquid crystal cell having a rear side and a plurality of areas for displaying letters, symbols or indications to be colored with different colorations; a light guide arranged at said rear side along

at least one of said plurality of areas and having an upper surface facing said liquid crystal cell and an end portion; light source means arranged at said end portion for illuminating said liquid crystal cell, light being transmitted to said liquid crystal cell through said upper surface of said light guide, said light source transmitting a color light to said end portion of said



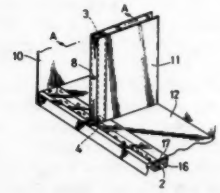
light guide; a light shaft located behind said liquid crystal cell adjacent to said light guide; and an incandescent light source located in said light shaft, said light guide having a light coupling surface for transmitting a portion of light from said incandescent light source to said at least one of a plurality of areas to provide a uniform background brightness of the liquid crystal cell.

5,063,380

DISCRETE OBJECT SEARCHING APPARATUS FOR SEARCH OF DISCRETE FILES AND THE LIKE

Shinji Wakura, Osaka, Japan, assignor to Kabushiki Kaisha Asahi Denshi Kenkyujyo, Osaka, Japan

Continuation of Ser. No. 314,129, Feb. 23, 1989, abandoned. This application Oct. 4, 1990, Ser. No. 593,501
Claims priority, application Japan, Feb. 24, 1988, 63-42828
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—825.54 **15 Claims**



1. A discrete object search apparatus for searching and locating discrete objects comprising:

at least one cabinet having a plurality of shelves therein, each shelf having a groove defined therein with a transparent plate covering each of the grooves;

a plurality of infrared signal transmitters on each shelf for transmitting signals corresponding to the discrete objects being searched, each of the grooves having a plurality of said transmitters disposed therein along a longitudinal length thereof, adjacent transmitters being generally equidistantly spaced from one another, each of said discrete objects having a unique signal associated therewith;

infrared receivers individually mounted to each of the objects, each of said infrared receivers being associated with one separate, single one of said infrared transmitters, each of said infrared receivers having a receptor, a data processing portion and an external indicator, said receptor portion and said data processing portion being directly connected to each other without an amplifier portion therebetween and said data processing portion being operatively connected to the external indicator, said receptor portion receives infrared signals from the one infrared signal transmitter associated therewith, the infrared signals being transmitted from the infrared transmitter through a transparent plate covering the groove and to the receptor portion of the receiver, said data processing portion being actuated when the signal associated with the discrete object in which the infrared receiver is mounted is received, said external indicator thereafter being actuated to indicate correspondence between said signal transmitted by the infrared signal transmitters and said receivers to show a location of a desired one of the discrete objects, said infrared transmitters being located in a position to enable the infrared transmitters to transmit to the receptor portion a necessary amount of infrared light for actuating the data processing portion, and the receptor portion of each infrared receiver being in close proximity to the infrared signal transmitter associated therewith; and

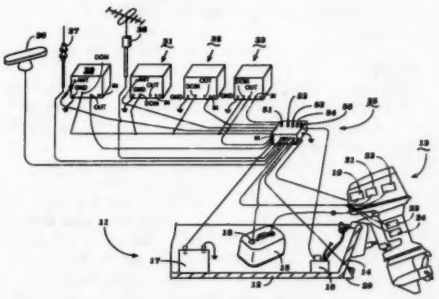
means for cutting off visible light to the receptor portion to thereby prevent actuation of the data processing portion by visible light, said means for cutting off visible light permitting infrared light to reach the receptor portion.

5,063,381

VESSEL RUNNING INFORMATION DISPLAY CONTROL SYSTEM

Saburo Ito, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation-in-part of Ser. No. 388,684, Aug. 2, 1989, Pat. No. 4,988,996. This application Feb. 28, 1990, Ser. No. 486,250
Claims priority, application Japan, Feb. 28, 1989, 1-49268
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—984 **3 Claims**



1. A vessel display system comprising a first output device for sensing a vehicle operating condition within a normal range and an abnormal condition and providing first output signals representative of a normal condition within the normal range and an abnormal condition when outside of the normal range, a second output device providing a second output signal of other information than the vehicle operating condition, a single display means for displaying information from said signals, and control means for switching said display means from a first condition wherein one of the first output signals is displayed during initial vehicle operation and in the event of an abnormal condition and wherein the second output signal is displayed at all other times and a second condition wherein one of the first output signals is displayed at all times.

5,063,382

CONSTRUCTION FOR MOUNTING A CAP TO A MAGNETIC TYPE ROTARY ENCODER

Yasuhisa Ohsumi, Sendai, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1990, Ser. No. 574,708
Claims priority, application Japan, Nov. 22, 1989, 1-134863[U]
Int. Cl.[5] H03M *1/22*
U.S. Cl. 341—15 **2 Claims**

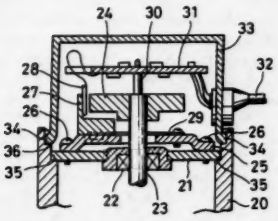
1. A construction for mounting a cap (33) having a first open

edge (34) to a magnetic type rotary encoder, said rotary encoder comprising:

a housing (20) defining a second open edge; and

a base plate (21) disposed in said housing adjacent said second open edge; said construction for mounting comprising:

a first shoulder (35) formed on an inside surface of said



housing (20) adjacent said second open edge for receiving said base plate (21);

a second shoulder (36) formed on said inside surface of said housing adjacent said second open edge for receiving said first open edge (34) of said cap (33); and

caulking disposed on said housing (20) adjacent said second open edge such that said cap (33) is secured to said housing (20).

5,063,383

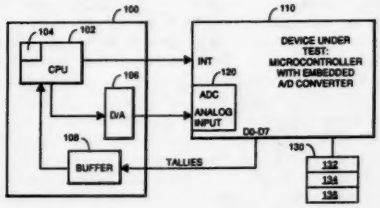
SYSTEM AND METHOD FOR TESTING ANALOG TO DIGITAL CONVERTER EMBEDDED IN MICROCONTROLLER

Ram S. Bobba, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 4, 1990, Ser. No. 532,606

Int. Cl.[5] H03M *1/10*; G06F *11/00*

U.S. Cl. 341—120 **16 Claims**



1. A method of testing an analog to digital converter (ADC) embedded in a microprocessor, said embedded ADC generating a predefined number of distinct, digital output values when converting input analog signals, said microprocessor having a random access memory embedded in said microprocessor for storing data values and program means coupled to said microprocessor for storing software which controls the operation of said microprocessor, the steps of the method comprising:

storing in said microprocessor's program mean a data tallying control program;

generating a sequence of analog test signals within a predefined range and transmitting said analog test signals to said embedded ADC;

said embedded ADC converting each said analog test signal and generating a digital output value;

said microprocessor, under control of said data tallying control program, tallying said digital output values generated by said embedded ADC and storing corresponding tally values in said microprocessor's embedded random access memory; and

after said sequence of analog test signals has been transmitted and converted, transmitting said tally values stored in said embedded random access memory in said microprocessor to a tester, and then evaluating said tally values in said tester.

5,063,384

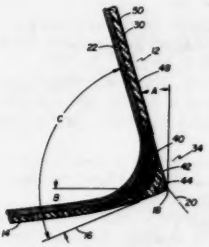
AIRCRAFT CONSTRUCTION

Philip F. Novak; Robert D. Shannon, both of Wichita, Kans.; Robert L. Pinckney, Cheyney, Pa., and James R. Humphreys, Jr., Wichita, Kans., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 295,644, Jul. 17, 1963, Pat. No. 4,924,228. This application Oct. 13, 1989, Ser. No. 420,866

Int. Cl.[5] H01Q *17/00*

U.S. Cl. 342—1 **5 Claims**



1. A structure for minimizing reflection of microwave energy back to its source comprising:

a layer of structural plastic foam;

microwave energy absorbing material filling said foam, and said filled foam having a dielectric constant of between two and ten and having a loss tangent of between 0.05 and unity and having a resistivity of between one hundred and ten thousand microohms per centimeter; and

a skin of thin plastic material reinforced with non-metallic fiber covering said filled structural plastic foam.

5,063,385

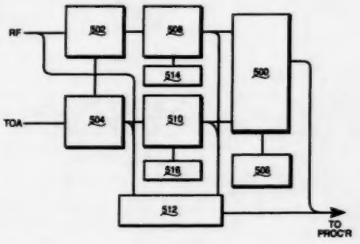
RADAR WARNING RECEIVER COMPRESSED MEMORY HISTOGRAMMER

Joseph Caschera, Fairborn, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 12, 1991, Ser. No. 684,074

Int. Cl.[5] G01S *7/36*; H04K *3/00*

U.S. Cl. 342—13 **14 Claims**



1. A method for preserving radar warning receiver generated pulse descriptor words for subsequent histogram organized processing comprising the steps of:

initializing each location of a frequency characterizing pulse descriptor word portion first memory and a time difference of arrival second memory to flag bit active predetermined initial condition;

storing, in a location of said first memory accessed by the frequency characterizing portion of an arriving pulse

descriptor word from said receiver, the current contents of a first counter circuit;

remembering the time of arrival of said pulse descriptor word in a last time of arrival third memory;

incrementing the contents of said first counter circuit by one count;

computing the time difference of arrival value between each new pulse descriptor word arriving from said receiver and the remembered time of arrival stored in said third memory;

said storing, remembering, and computing steps being inhibited and said computing step enabled, however, by prior deactivation of said flag bit in said first memory accessed location;

addressing a location in said time difference of arrival second memory with said computed time difference of arrival value;

testing said addressed second memory location for presence for said second memory predetermined initial flag bit active condition therein;

setting the contents of said addressed second memory location to the present contents of a second counter circuit;

indexing the contents of said second counter circuit by one count;

said setting and indexing step being inhibited, however, by prior deactivation of said flag bit in said addressed second memory location;

accessing a histogram organized fourth memory location by the combined stored data from said first and second;

testing said accessed fourth memory location for an initial volume of zero;

incrementing said accessed fourth memory location by one;

if initial state of said accessed fourth memory location prior to incrementing is zero;

recording in an active pixel fifth memory, in the first available location therein, the address parameters and the most recently stored values from said frequency characterization first memory and said time difference of arrival second memory;

whereby active only pixel storage and reduced memory size requirements for said active pixel fifth memory are achieved.

5,063,386

DEVICE FOR THE DETECTION OF THE SIGNALS OF TRANSPONDERS INTERROGATED BY A SECONDARY RADAR IN THE PRESENCE OF MULTIPLE-PATH PHENOMENA

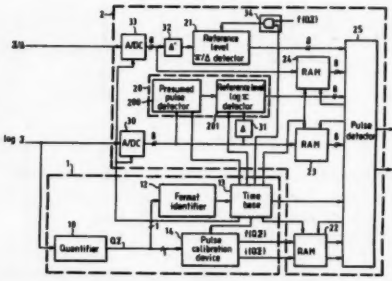
Alain Bourdeau, Limours, and Claude de Volder, Auffargis, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Oct. 23, 1990, Ser. No. 601,351

Claims priority, application France, Nov. 3, 1989, 89 14416

Int. Cl.[5] G01S *13/78, 13/44*

U.S. Cl. 342—40 **6 Claims**



1. A device for detecting transponder signals generated by transponders interrogated by a secondary radar in the presence of multiple-path phenomena, wherein each of said transponder signals is formed by a pulse train arranged in a determined format with formatting pulses that identify the position of data pulses, wherein said device comprises:

a format identification circuit for identifying the format of a transponder signal including means for detecting said formatting pulses contained in a reception signal;

a time base synchronized by said format identification circuit and including means to generate timing signals for identifying time intervals in said reception signal that may possibly be occupied by data pulses of a transponder signal, and for identifying a middle of said time intervals and zones centered on said middles of said time intervals;

a presumed pulse determining circuit for determining presumed data pulses in said reception signal, said presumed pulse determining circuit having its timing rate set by said time base and including means to set up a correlation between a first, a second and a third sample of respective levels of said reception signal, wherein said first sample is taken at said middle of each said time interval that may possibly be occupied by a data pulse of a transponder signal, and said second sample and said third sample are taken during each said time interval at instants surrounding an instant when said first sample is taken, said presumed pulse determining circuit further including means to generate a weighting coefficient which is associated with each level determined by said first sample, and represents a probability of the presence of a data pulse in said time interval that may possibly be occupied by a data pulse of a transponder signal, wherein a value of said weighting coefficient corresponds to a level of correlation of said first sample, said second sample and said third sample;

a circuit for determining a reference level of said reception signal, thereby determining a reference amplitude level of pulses for each of the signals of said transponder whose format has been identified in said reception signal by said format identification circuit, said circuit for determining a reference level having its timing rate set by said time base and including means to select said reference level of said reception signal based on a maximum value of a frequency of occurrence of a level of said reception signal taken in the middle of each said time interval that may possibly be occupied by data pulses of a transponder signal wherein each said level considered is weighted by the weighting coefficients prepared by said circuit for determining presumed data pulses; and,

a circuit for detecting data pulses in said reception signal for each transponder signal whose format has been identified in the reception signal by said format identification circuit, said circuit for detecting data pulses including means for the recognition of a data pulse whenever a level of said reception signal at the middle of a time interval that might possibly be occupied by a data pulse belongs to a range of values centered on said reference level determined by said circuit for determining the reference level of the reception signal.

5,063,387

DOPPLER FREQUENCY COMPENSATION CIRCUIT

Vaughn L. Mower, Bountiful, Utah, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 20, 1989, Ser. No. 439,907

Int. Cl.[5] H04L *27/30*

U.S. Cl. 342—103 **16 Claims**

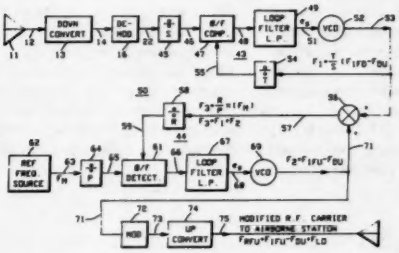
1. A doppler frequency compensation circuit for a data link system comprising:

a moving airborne station source of coherent downlink R.F. signals comprising a fixed frequency carrier signal and a modulating data signal,

a ground station for receiving said coherent R.F. signals,

means in said ground station for recovering an I.F. carrier signal from said received coherent signal which is shifted by the downlink doppler frequency effect,

a scaling phase-locked loop coupled to said shifted I.F. carrier signals for producing a deviation frequency signal at said ground station which is inversely proportional to an uplink doppler frequency, and



an inverting phase-locked loop coupled to said deviation frequency signal for producing uplink I.F. doppler frequency compensated signals.

5,063,388

METHOD FOR THE ASSIGNING OF RADAR RECURRENCES TO RADIALS TO BE DISPLAYED AND IMAGE DIGITAL CONVERTER TO IMPLEMENT SAID METHOD

Dominique Gault, Ville36'Avray; Jean-Pierre Andrieu, Paris, and Jean-Claude Henri, Boulogne Billancourt, all of France, assignors to Thomson-CSF, Puteaux, France

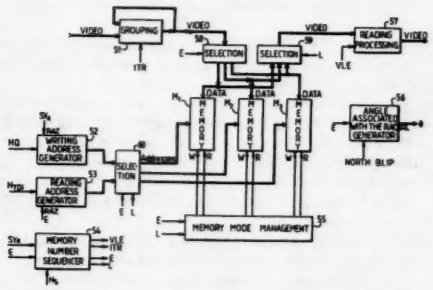
PCT No. PCT/FR88/00250, § 371 Date Nov. 15, 1989, § 102(e) Date Nov. 15, 1989, PCT Pub. No. WO88/09514, PCT Pub. Date Dec. 1, 1988

PCT Filed May 17, 1988, Ser. No. 455,441

Claims priority, application France, May 22, 1987, 87 07206

Int. Cl.[5] G01S *7/298;* H04N *7/01*

U.S. Cl. 342—185 **8 Claims**



1. Method for the assigning of recurrences emitted by a radar to radials to be displayed, the recurrences being given at a first frequency which is the repetition frequency (PRF) of the radar and accompanied by a first synchronization signal (SY_R) formed by a first sequence of blips at the first frequency, and the radials being given at a second frequency in synchronism with a second synchronization signal (ϵ) formed by a second sequence of blips at the second frequency; the method being characterized by the fact that it comprises the following steps:

memorizing of the recurrences at the rate of their arrival in one of the memories of a group of m memories with $m \geqq 3$, the identification of the memory written in being changed at the first blip (SY_R) of the first sequence following a blip (ϵ) of the second sequence:

grouping of a recurrence received with the previously received and already memorized recurrence, should there have been no change in said identification of memory;

reading of at least one memory of said group to form a radial, upon reception of each blip (ϵ) of the second sequence, the identification of the memory read being obtained from that of the memory written in at the same instant.

5,063,389

ANTENNA SYSTEM WITH ADJUSTABLE BEAM WIDTH AND BEAM ORIENTATION

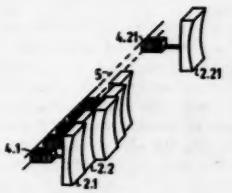
Bernard J. Reits, Hengelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Continuation of Ser. No. 318,995, Mar. 3, 1989, abandoned. This application Sep. 13, 1990, Ser. No. 582,808

Claims priority, application Netherlands, Mar. 8, 1988, 8800538

Int. Cl.[5] H01Q *3/00, 15/14, 15/20*

U.S. Cl. 342—359 **21 Claims**



1. An antenna system comprising:

an active radiation source having a wavelength λ;

a substantially flat, contoured surface formed by a plurality of separate and independently adjustable adjacent reflecting plates having transverse dimensions on the order of the wavelength λ positioned for reflecting the radiation and forming at least one radiation beam; and

adjusting means for dynamically translating the plates with respect to each other during operation of the antenna system, thereby determining the antenna beam pattern;

wherein, for orienting at least one beam, the plates are arranged in groups of plates for which the mutual difference in radiation path distance from the active radiation source to two adjacent plates respectively belonging to the same group is much less than $n \times \frac{1}{4}\lambda$ ($n = 1, 2, \ldots$) and where the mutual difference in radiation path distance from the active radiation source to the two adjacent plates respectively belonging to different groups is substantially $n \times \frac{1}{4}\lambda$.

5,063,390

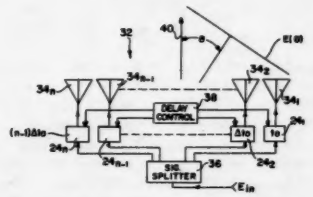
NON-DISPERSIVE ACOUSTIC TRANSPORT TIME DELAY BEAM STEERING ANTENNA

Charles E. Konig, Staten Island, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 19, 1991, Ser. No. 656,915

Int. Cl.[5] H01Q *3/22*

U.S. Cl. 342—375 **5 Claims**



1. Beam steering apparatus for phased array antenna assembly including a plurality of antenna elements, comprising;

variable charge transport delay line means coupled to each of said antenna elements, wherein each said charge trans-

port delay line means comprises an acoustic transport device; and

phase control means coupled to each said delay line means, wherein said phase control means controlls the phase shift imparted to respective RF energy coupled to and translated by said delay lines means,

whereby time delay beam steering of an RF wave is effected at said antenna.

5,063,391

METHOD OF MEASURING CHIRAL PARAMETERS OF A CHIRAL MATERIAL

Dwight L. Jaggard, Newtown Square, and Nader Engheta, King of Prussia, both of Pa., assignors to The Trustees of the University of Penn., Pa.

Filed Jun. 6, 1989, Ser. No. 362,072

Int. Cl.[5] G01R *29/80*

U.S. Cl. 343—703 **6 Claims**

1. A method of measuring chiral parameters of a chiral material, the steps of the method comprising:

providing at least one antenna sensing element;

irradiating the chiral material with electromagnetic energy from at least one transmitting antenna element thereby exciting the chiral material with the electromagnetic radiation and causing the electromagnetic energy to propagate in the chiral material according to two eigenmodes of propagation;

sensing the electromagnetic energy propagating in the chiral material according to the two eigenmodes of propagation with the antenna sensing element; and

determining the chiral parameters from the sensed electromagnetic energy propagating according to the two eigenmodes of propagation.

5,063,392

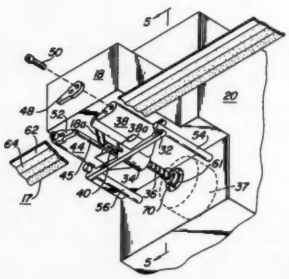
COLOR CHANGE SYSTEM FOR MULTICOLOR STRIP CHART RECORDERS

Daniel J. Carr, Harleysville; Charles R. Scally, Warminster; Bill M. McClennen, Harleysville; Michael D. Carney, Havertown; George Volkodav, North Wales, and Thomas J. Walsh, Hatboro, all of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Jan. 2, 1990, Ser. No. 459,848

Int. Cl.[5] G01D *9/28*

U.S. Cl. 346—46 **7 Claims**



1. In a printer having a registration element, which is selectively driven in traverse of a paper to be printed on over a line parallel to the paper; a ribbon having a plurality of parallel color bands, which ribbon is carried by a cartridge providing a supply of ribbon; and means for transporting the ribbon through a plane between a line of traverse of the element and a surface of the paper; the improvement which comprises:

a ribbon guide mounted so that said ribbon guide traverses the paper with said registration element, said ribbon guide having guiding surfaces positioned on each side of the registration element and close to said registration element, said guiding surfaces being shaped to guide the ribbon on a path which extends across the paper so that said ribbon will pass between the registration element and the paper,

a stepping motor mounted on said carriage for moving said ribbon guide in a direction normal to the line of traverse of the registration element and parallel to said plane so as to selectively position color bands of the ribbon under the registration element so that a selected color can be printed at selected positions across the paper as the registration element is driven in traverse of the paper; and

means for pivotally mounting said ribbon cartridge so that said ribbon cartridge is free to pivot about an axis above the line of traverse of the registration element whereby said ribbon is free to move in response to displacement of the ribbon by said movement of the ribbon guide in selection of the color band.

5,063,393

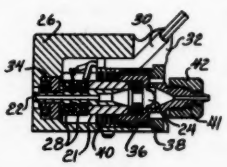
INK JET NOZZLE WITH DUAL FLUID RESONANCES

James E. Clark, Naperville, and Robert I. Keur, Niles, both of Ill., assignors to Videojet Systems International, Inc., Chicago, Ill.

Filed Feb. 26, 1991, Ser. No. 661,660

Int. Cl.[5] G01D *15/18;* **B23P** *15/00*

U.S. Cl. 346—75 **7 Claims**



1. A nozzle for drop marking comprising:

(a) a housing defining at least two fluid chambers therein adapted to receive a supply of marking fluid under pressure, each chamber having a characteristic fluid resonant frequency;

(b) transducer means for applying a stimulation voltage having an operating frequency f_0 to cause drop formation as said marking fluid issues from said housing;

(c) said fluid chambers being dimensioned so that one fluid resonant frequency is above the operating frequency f_0, while the other fluid resonant frequency is below f_0, said resonant frequencies being sufficiently close together that the magnitude of the stimulation voltage at an anti-resonance frequency therebetween is drivable by said transducer means;

whereby a robust operating region is defined between the resonances where substantially satellite free marking can occur while tolerating variations in stimulation voltage, temperature and the composition and/or characteristics of the marking fluid.

5,063,394

THERMAL RECORDING APPARATUS AND PRINT HEAD

Hitoshi Nagato, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1989, Ser. No. 385,091

Claims priority, application Japan, Jul. 26, 1988, 63-184511; May 17, 1989, 1-123604

Int. Cl.[5] B41J *2/325, 2/38, 2/39*

U.S. Cl. 346—76 PH **65 Claims**

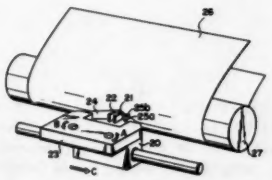
1. A thermal recording apparatus for recording on either of thermal paper or plain paper in accordance with recording data, comprising:

recording mode determining means for determining one of a current injection mode and a thermal paper mode;

hold means for holding an ink ribbon including a resistive base film and an ink layer in the current injection mode, ink being transferred from the ink layer to the plain paper upon reception of heat generated in the resistive base film in the current injection mode;

means for feeding the ink ribbon held by said hold means in a predetermined direction;

heat generating means, having heating points for generating heat in accordance with recording data, for applying heat from the heating points to thermal paper in the thermal paper mode, said heat generating means being brought into contact with the thermal paper in the thermal paper



mode and with the ink ribbon in the current injection mode to apply heat from the heating points to the ink ribbon; and

current injection means, having electrodes and being brought into contact with the ink ribbon in the current injection mode, for injecting a current from the electrodes to the ink ribbon in accordance with recording data so as to supply a current to the ink ribbon and to generate heat in the resistive base film of the ink ribbon in the current injection mode, said heat generating means being located at an upstream side of said current injecting means with respect to the predetermined direction in which the ink ribbon is fed.

5,063,395

THERMAL PRINTER HAVING A PLATEN WHICH CAN BE PRESSED AGAINST A THERMAL HEAD

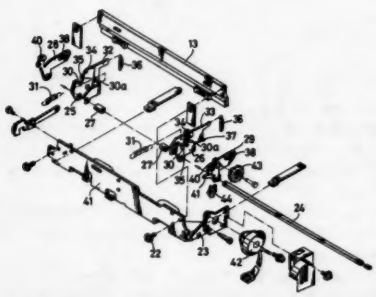
Akira Nuita, and Katsuhiko Kawaguchi, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1990, Ser. No. 487,447

Claims priority, application Japan, Mar. 6, 1989, 1-25467[U]; Apr. 7, 1989, 1-41261[U]

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH **3 Claims**



1. A thermal printer comprising:

a platen having shaft parts on each end thereof;

a head frame;

a thermal head fixedly mounted on said head frame;

a supporting shaft rotatably mounted on said head frame;

first and second supporting levers rotatably mounted on both sides of said supporting shaft, each of said first and second supporting levers comprising an opening for supporting the shaft parts of said platen;

a first energizing means for energizing said supporting levers in a direction of movement toward said thermal head;

first and second stop levers rotatably mounted on said first and second supporting levers, each of said first and second stop levers comprising depression parts for abutting against external peripheral surfaces of said shaft parts of said platen, said first and second stop levers further comprising a pin having a shaft center which is parallel to said supporting shaft;

a second energizing means for energizing said first and second stop levers in order to move said depression parts of said stop levers toward a lower portion of the opening of said first and second supporting levers;

first and second release levers fixedly mounted on both ends of said supporting shaft;

abutment parts disposed on opposing surfaces of said stop levers and said release levers for abutting on each other and transmitting force between said stop levers and said release levers; and

hooks formed on a portion of said openings of each of said first and second supporting levers, said hooks facing, with a predetermined gap, an outer periphery of small diameter parts formed on said shaft parts of said platen.

5,063,396

DROPLETS JETTING DEVICE

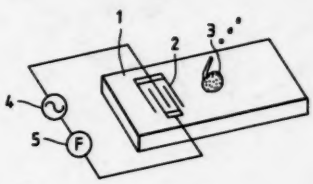
Shoko Shiokawa; Yoshikazu Matsui, and Toshihiko Ueda, all of Shizuoka, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,446

Claims priority, application Japan, Mar. 14, 1989, 1-61289

Int. Cl.[5] B41J *2/04*; G01D *15/16*

U.S. Cl. 346—140 R **6 Claims**



1. A droplets jetting device, comprising:

a substrate having a piezo-electric material for generating a Rayleigh mode elastic surface wave in response to an AC voltage applied thereon, said substrate including a surface for propagation of said wave thereupon;

a pair of input electrodes formed on the surface of said substrate, for applying an AC voltage to said substrate;

AC voltage generator means for generating an AC voltage and applying said AC voltage to said input electrodes;

pulse signal generator means for causing said AC voltage to occur intermittently;

means for placing liquid droplets on the surface of said substrate, said droplets being placed downstream of and propagating in the same direction as the Rayleigh surface wave.

5,063,397

VARIABLE-THICKNESS IMAGING MEMBERS

Frank Jansen, and Inan Chen, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 25, 1990, Ser. No. 528,874

Int. Cl.[5] G01D *15/06, 9/00*; G03G *15/06*

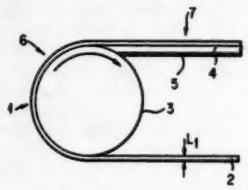
U.S. Cl. 346—153.1 **25 Claims**

1. An imaging device, comprising:

dielectric means for receiving a charge: p1 conductive means for attracting said charge, said conductive means

having a first conductive part and a second conductive part; and

spacer means for insuring that at a first position, a distance



form an outer surface of said dielectric means to said first conductive part is different from a distance form said outer surface of said dielectric means to said second conductive part at a second position.

5,063,398

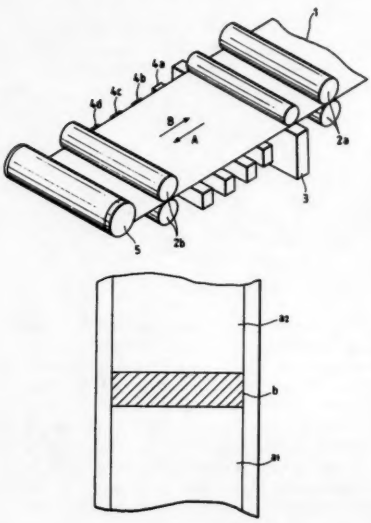
COLOR IMAGE RECORDING APPARATUS

Hiroaki Murai, Chigasaki; Tatsuya Katano, Fujisawa, and Shigeki Kikuchi, Hamakita, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Mar. 6, 1991, Ser. No. 665,127

Int. Cl.[5] G03G *15/01*

U.S. Cl. 346—157 7 Claims



1. A color image recording apparatus for recording a composite color image composed of a plurality of superimposed images of different colors on a recording medium, comprising:

feed means for reciprocally feeding the recording medium in successive strokes;

latent image forming means for forming first latent images on the recording medium in the respective strokes;

a plurality of developing means for developing the first latent images formed on the recording medium into respective visible images with respective developers of different colors which are supplied respectively to said developing means, in the respective strokes; and

control means for controlling said latent image forming means to form second latent images each of a predetermined length on the recording medium after the respective first latent images are formed in the respective strokes by said latent image forming means.

5,063,399

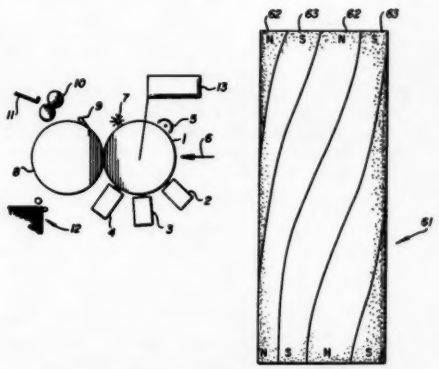
ELECTROPHOTOGRAPHIC APPARATUS HAVING REDUCED DRUM DRIVE FLUTTER

Robert E. Zeman, Webster, and Kevin M. Johnson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1990, Ser. No. 563,022

Int. Cl.[5] G03G *15/09*

U.S. Cl. 346—160.1 7 Claims



1. A printing apparatus comprising:

a rotatable metal drum having one or more layers upon which electrostatic images are formable,

electronic means for forming electrostatic images on said drum,

toning means for applying toner to said electrostatic images to form a toner image, said toning means including

a non-magnetic sleeve,

a rotatable magnetic core inside said sleeve,

means for rotating said core to move a magnetic developer through a development zone on said sleeve,

said magnetic core being generally cylindrical and including an arrangement of magnetic poles in which said poles alternate circumferentially and vary along the length of said core so that said metal drum is subjected to magnetic pole transitions which vary in phase along the length of said drum.

5,063,400

LENS-FITTED PHOTOGRAPHIC FILM PACKAGE

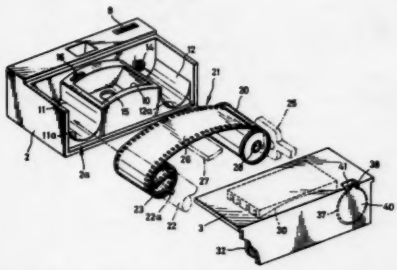
Hisashi Takei, Kanagawa; Hiroshi Ohmura, Tokyo; Seimei Ushiro, Tokyo; Mitsuyoshi Mochida, Tokyo; Yoshihiko Nakamura, Kanagawa; Seiji Asano, Saitama, and Toshio Yoshida, Ibaragi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 111,156, Oct. 19, 1987, Pat. No. 4,890,130. This application Dec. 22, 1989, Ser. No. 454,972

Claims priority, application Japan, Oct. 17, 1986, 61-246979; Jan. 19, 1987, 62-5696; Feb. 12, 1987, 62-30140; Aug. 19, 1987, 62-126190; Jan. 19, 1987, 62-5699

Int. Cl.[5] G03B *17/02*

U.S. Cl. 354—288 17 Claims



1. A lens-fitted photographic film package comprising a light-tight film case with a taking lens fitted thereto, a separate empty light-tight film cartridge having a spool therein rotatable about an axis of rotation, said film cartridge being enclosed in said light-tight film case on one side of said lens, an unexposed rolled film with its one end retained on said spool in said film cartridge, said unexposed rolled film being disposed on the other side of said taking lens with its outermost turn in contact with said film case, said light-tight film case comprising a main case section which has a film cartridge receiving chamber with an opening at its bottom for removably receiving said film cartridge and a rolled film receiving chamber for receiving said rolled film, a rear and bottom case section which is securely fixed to a rear side and said bottom of said main case section and cannot be disassembled therefrom and which closes said chambers, and a third member carried only by a bottom portion of said rear and bottom case section and sealing said opening at the bottom of said film cartridge receiving chamber, said third member being disposed only on said one said of said lens in alignment with said axis and openable to expose said opening of said film cartridge receiving chamber so as to allow said film cartridge to be removed, said film package being devoid of means for advancing a film rolled on a said cartridge from said one side of said lens into a rolled configuration on said other side of said lens.

5,063,401

WET TREATMENT ARRANGEMENT FOR PHOTOGRAPHIC SHEET CARRIERS

Angelika Oberkersch; Anton Pirmann, and Helmut Schausberger, all of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

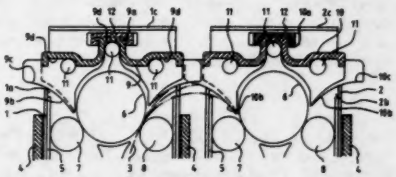
Filed Dec. 10, 1990, Ser. No. 625,224

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1990, 4000114

Int. Cl.[5] G03D *3/08*

U.S. Cl. 354—320 6 Claims

1. A wet treatment arrangement for photographic sheet carriers, comprising at least one liquid tank having an inlet slot and an outlet slot; and an upper side; at least one transporting roller located in said tank for transporting a sheet carrier from said inlet slot to said outlet slot; a cover part covering said upper side of said tank and provided with guiding surfaces for guiding a sheet carrier from said inlet slot to said transporting roller and from said transporting roller to said outlet slot, and also provided with transfer guiding surfaces, said first mentioned guiding surfaces and said transfer guiding surfaces



merging with one another and being formed as guiding ribs extending transversely to a length of said rollers and parallel to one another.

5,063,402

APPARATUS FOR RETRACTING A PHOTO-TAKING LENS

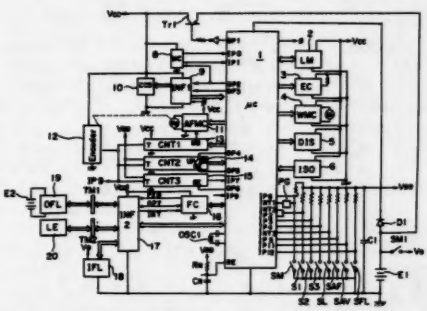
Takahisa Shimada; Toshio Yamaki, both of Osaka; Kenji Tsuji, Kashiwara; Masaaki Nakai, Kawachinagano; Akihiko Fujino, and Hiroshi Ootsuka, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 563,950, Aug. 7, 1990, abandoned, which is a continuation of Ser. No. 421,300, Oct. 10, 1989, abandoned, which is a continuation of Ser. No. 196,817, May 17, 1988, abandoned, which is a continuation of Ser. No. 66,764, Jun. 25, 1987, abandoned. This application Oct. 23, 1990, Ser. No. 602,911

Claims priority, application Japan, Jun. 25, 1986, 61-150478

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—400 23 Claims



1. A lens retracting apparatus in a photo-taking device which comprises:

a photo-taking lens including a focusing lens;

a focus detecting means;

means for driving the focusing lens so that a front end of the photo-taking lens is selectively retracted and extended by means of the drive of the focusing lens;

first means for controlling the driving means to drive the focusing lens towards an in-focus position on the basis of a result of focus detection carried out by the focus detecting means;

a first switch manually operable to start the focus detecting operation of the focus detecting means;

a second switch selectively switchable between a first position for enabling an operation of said first switch and a second position for disabling the operation of said first switch;

second means in response to the switching of the second switch from the first position to the second position for controlling the driving means to drive the focusing lens so that the front end of the photo-taking lens is retracted;

means for determining whether or not the focusing lens is located at a predetermined position; and

third means for controlling the driving means to stop the movement of the focusing lens caused by the second controlling means when a condition in which the focusing lens is driven to the predetermined position is determined by the determining means.

5,063,403

ELECTRONIC FLASH APPARATUS FOR CAMERA

Norikazu Yokonuma, Tokyo; Nobuyoshi Hagiuda, Kawasaki; Yoshikazu Iida, Chigasaki; Hiroshi Sakamoto, Kawasaki, and Hideki Matsui, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

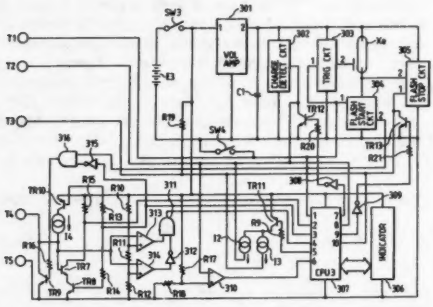
Continuation of Ser. No. 354,301, May 19, 1989, abandoned.

This application Feb. 25, 1991, Ser. No. 659,547

Claims priority, application Japan, May 23, 1988, 63-125571

Int. Cl.[5] G03B *7/00, 15/03*

U.S. Cl. 354—413 **8 Claims**



1. An electronic flash apparatus for use with a camera which selectively assumes an information transfer state capable of effecting information transfer to said electronic flash apparats or a flash photographing state capable of effecting a flash photographing operation, comprising:

a terminal to be electrically connected to said camera, said terminal inputting a light stop signal from said camera for stopping a flashing operation of said electronic flash apparatus, said electronic flash apparatus transferring information to said camera through said terminal;

current supply means for supplying current to said terminal; and

discriminating means for discriminating whether said camera is in said information transfer state or is in said flash photographing state, said discriminating means causing said current supply means to supply first current to said terminal when said discriminating means discriminates that said camera is in said information transfer state, said discriminating means causing said current supply means to supply second current to said terminal, which is lower than said first current, when said discriminating means discriminates that said camera is in said flash photographing state.

5,063,404

DOCUMENT ILLUMINATION ASSEMBLY ADAPTED TO REDUCE PLATEN OVERHEATING

Richard J. Milillo, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

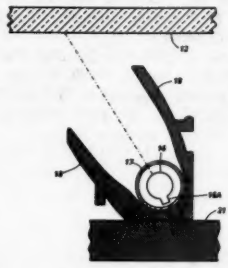
Filed Dec. 3, 1990, Ser. No. 620,693

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—30 **6 Claims**

1. In a document scan/illumination system wherein a document on a document platen is incrementally illuminated by a scan assembly beneath said platen, said scan assembly adapted to reduce heat buildup at the platen and including, in combination

an elongated illumination lamp, and



a glass tube annulus open at both ends to create a partially confined interior space between said lamp and annulus.

5,063,405

APPARATUS FOR FORMING IMAGES

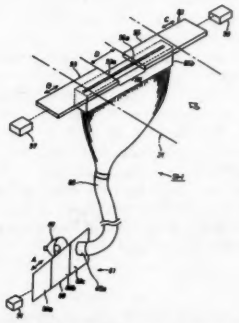
Kenji Sakakibara, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya Aichi, Japan

Filed Sep. 25, 1990, Ser. No. 588,583

Claims priority, application Japan, Oct. 18, 1989, 1-271394

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—32 **23 Claims**



1. An image forming apparatus for forming chromatic images on a copy sheet, comprising:

a light source for illuminating an original;

a photosensitive recording medium;

focusing means for focusing light reflected from the original onto the photosensitive recording medium to form a latent image on the photosensitive recording medium;

supplementary exposing means for irradiating a desired area on the photosensitive recording medium with a desired chromatic light to convert the color of the image only in the desired area, the desired area irradiated by said supplementary exposing means being smaller than the area onto which light is reflected from the original; and

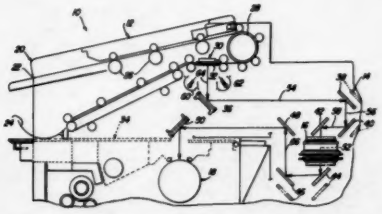
image transferring means for forming chromatic images on the copy sheet corresponding to the latent image on the photosensitive recording medium.

5,063,406

COPYING MACHINE

Paul Braun, and Ronald W. Kwasniewicz, both of Farmington, assignors to Kwaun Manufacturing Company, Walled Lake, Mich.

Filed Nov. 19, 1987, Ser. No. 122,900
Int. Cl.[5] G03B 27/34
U.S. Cl. 355—57 4 Claims



1. A copy machine comprising: a housing (134); original document support means (32) for supporting an original document to be copied; mirror and lens means (14,16) for reflecting and focusing an image from said support means (32) to an image fixing means (18); image fixing means (18) for fixing the reflected image on a substrate; and characterized by including a slide track (13) within said housing (134) and mirror and lens support means mounted in said track (14,16) for supporting said mirror (14) and lens means (16) as a module slideably on said track (130) for sliding extension from and retraction back into said housing to expose said entire module outside of said housing.

5,063,407

METHOD AND APPARATUS FOR RECORDING IMAGE

Atsushi Takagi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 20, 1990, Ser. No. 630,652
Claims priority, application Japan, Dec. 21, 1989, 1-332208; Dec. 21, 1989, 1-332209
Int. Cl.[5] G03B 27/80
U.S. Cl. 355—68 12 Claims

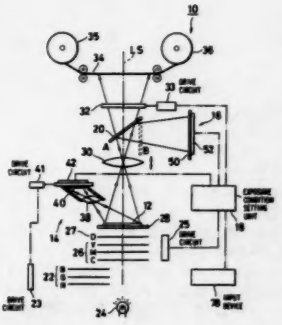
1. A method of recording image which comprises the steps of:

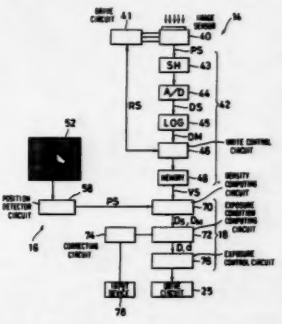
performing photometry on a plurality of pixels into which an original film is divided;

measuring the large-area transmittance density of said original film on the basis of the photometric values for individual pixels;

designating the main area of said original film and measuring the average transmittance density of the designated main area;

determining conditions of exposure as appropriate for said original film on the basis of a linear relationship between the basic density of exposure associated with said large-area transmittance density and the average transmittance density of the main area; and





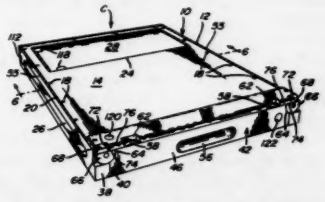
permitting the image information on said original film to be recorded on a light-sensitive material under said appropriate conditions of exposure.

5,063,408

MOTORIZED SHEET FILM CARTRIDGE

Najeeb A. Khalid, Montreal; Larry Adams, Dorval; Stan Schwartz, and Jean Wong, both of Montreal, all of Canada, assignors to Escher-Grad Incorporated, Montreal, Canada

Filed Mar. 22, 1991, Ser. No. 673,333
Int. Cl.[5] G03B 27/58
U.S. Cl. 355—72 18 Claims



1. A motorized sheet film cartridge comprising a housing means for containing at least one sheet film, said housing means defining an opening, a film access door means and a door drive means for displacing said door means between an open position for allowing the sheet film to be removed from said housing means or inserted therein through said opening and a closed position wherein said door means closes said opening, said door drive means being adapted to be actuated by an external

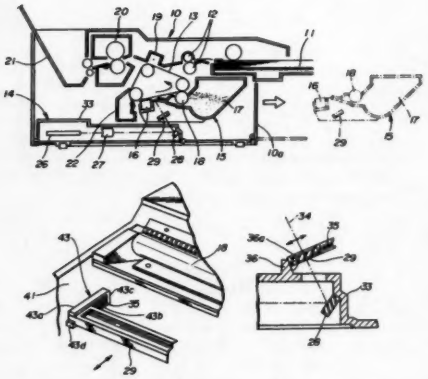
control means for selectively opening or closing said door means.

5,063,409

IMAGE RECORDING APPARATUS AND EXCHANGING UNIT USED IN THE SAME

Tomohiro Nakajima, Machida, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 8, 1990, Ser. No. 610,551
Claims priority, application Japan, Nov. 9, 1989, 1-130906[U]
Int. Cl.[5] G03G *15/00, 15/21*
U.S. Cl. 355—200 20 Claims



1. An image recording apparatus having a photo sensitive member, which apparatus records an image in accordance with an electrophotography process, said image recording apparatus comprising:

a housing;

an optical system provided in said housing, for emitting a light beam used for the electrophotography process;

a stopper member provided in said housing at a predetermined position; and

an exchanging unit detachably provided in said housing and having at least a device used for the electrophotography process, said exchanging unit further comprising,

an optical member,

a supporting mechanism for movably supporting said optical member, and

an elastic member for pressing said optical member onto said stopper member when said exchanging unit is loaded in said housing at a predetermined position,

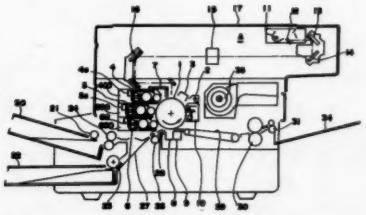
wherein the light beam emitted from said optical system passes through said optical member in said exchanging unit and is projected onto said photo sensitive member.

5,063,410

IMAGE FORMING APPARATUS HAVING A PLURALITY OF REMOVABLE DEVELOPING DEVICES

Naoyoshi Kinoshita, and Keiji Kusumoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 9, 1990, Ser. No. 477,462
Claims priority, application Japan, Feb. 10, 1989, 1-31955
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—204 14 Claims



1. An image forming apparatus comprising:

a photoreceptor rotatable in a predetermined direction;

a plurality of developing portions arranged one by one in the direction of the photoreceptor rotation;

a plurality of developing units attachable to the developing portions respectively for accommodating different kinds of developer;

detecting means for detecting attachment of at least one of the plurality of developing units accommodating a specific kind of developer; and

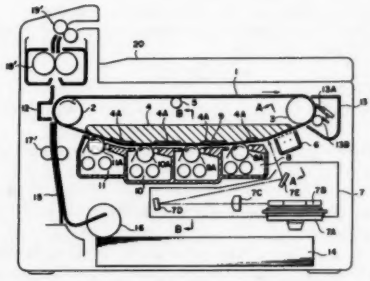
control means responsive to said detecting means for regulating operation of the developing portions to which the developing units accommodating the developer are attached except for at least one of the plurality of developing units accommodating the specific kind of developer.

5,063,411

COLOR IMAGE FORMING APPARATUS HAVING A UNITARY GUIDE PLATE FACING A PLURALITY OF DEVELOPING DEVICES

Satoshi Haneda; Masakazu Fukuchi; Shunji Matsuo, and Shizuo Morita, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 8, 1990, Ser. No. 535,121
Claims priority, application Japan, Jun. 16, 1989, 1-153743; Jul. 7, 1989, 1-177729; Jul. 25, 1989, 1-192874
Int. Cl.[5] G03G *5/00, 15/01*
U.S. Cl. 355—212 15 Claims



1. A color image forming apparatus, comprising:

a photoreceptor endless belt;

a unitary guide plate having a guide surface for guiding said endless belt, said guide surface including;

a plurality of contact portions which contact said endless belt; and

at least one non-contact portion which does not contact said endless belt;

a plurality of developing means each positioned to respectively face a different one of said plurality of contact portions; and

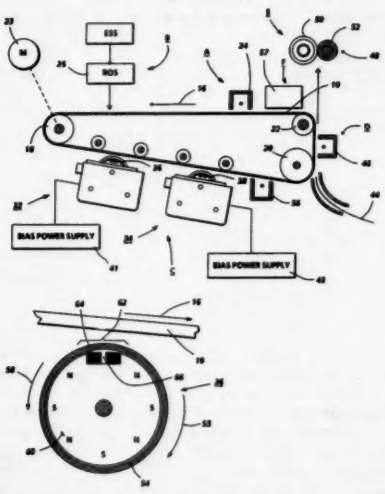
said endless belt being mounted on said guide plate to pass between said guide surface and each of said plurality of developing means.

5,063,412

DEVELOPMENT APPARATUS USING AN ELECTROMAGNET TO PREVENT DEVELOPMENT IN THE NON-OPERATIVE MODE

Mark J. Hirsch, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1990, Ser. No. 588,406
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—259 **10 Claims**



1. An apparatus for developing a latent image recorded on a member with developer material, including:

means for transporting the developer material into a development zone, in the operative mode, and removing developer material from the development zone, in the non-operative mode, so as to develop the latent image recorded on the member with developer material in the operative mode and prevent development thereof in the non-operative mode;

means for attracting the developer material to said transporting means, said attracting means includes a magnet operatively associated with said transporting means to attract developer material thereto, said magnet being adapted to generate a weak magnetic field in the development zone; and

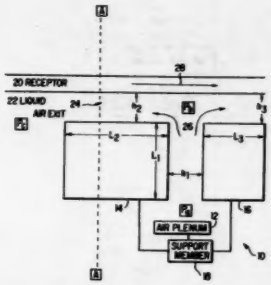
means, operable in the non-operative mode, for changing the attraction in the development zone between the developer material and said transporting means so that the developer material moves with said transporting means away from the development zone, said changing means includes an electromagnet adapted to be energized in the non-operative mode to decrease the magnet field gradients in the development zone.

5,063,413

REMOVAL OF EXCESS LIQUID FROM AN IMAGE RECEPTOR

Gerald A. Domoto, and Aron Sereny, both of Briarcliff Manor, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 31, 1990, Ser. No. 560,814
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—296 **20 Claims**



1. An apparatus for removing excess liquid from a surface of an image receptor, comprising:

means for effecting air flow in a direction substantially parallel to and opposite the direction of movement of the image receptor, said air flow being effected at a velocity greater than the velocity of movement of said image receptor, said effecting means applying a shearing action to a surface of said image receptor to remove any excess liquid present thereon, said effecting means including members defining flow paths for passage of air and excess liquid, said effecting means being self-compensating so that dimensions of the flow paths can be varied without affecting the applied shearing action.

5,063,414

COPIER ALLOWING SUCCESSIVE COPYING OPERATIONS WHILE AVOIDING CERTAIN WAITING PERIOD

Kouji Shirasugi, Satte, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 15, 1989, Ser. No. 451,232
Claims priority, application Japan, Dec. 28, 1988, 63-329066
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—296 **3 Claims**

1. A copier in which an operation mode is switched from a copy mode to either a power off mode or a preheat mode on the lapse of a predetermined period of time after a copying operation, the copier comprising:

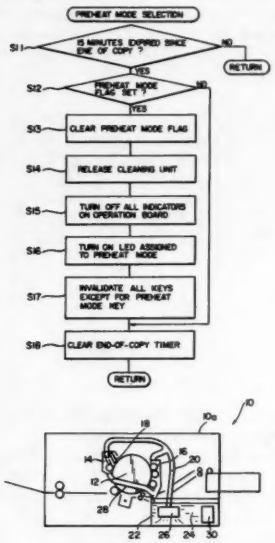
a photoconductive element;

a cleaning unit including a cleaning structure, the cleaning structure being released from the photoconductive element in response to switchover of the operation mode;

temperature sensing means responsive to a temperature of a liquid developer which is fed to the photoconductive element and the cleaning unit; and

control means, responsive to the temperature sensed by the temperature sensing means, for continuing the copy mode

to avoid a waiting period before a subsequent copying operation when the temperature sensed by the temperature sensing means is lower than a predetermined temperature.



5,063,415

IMAGE FORMING APPARATUS

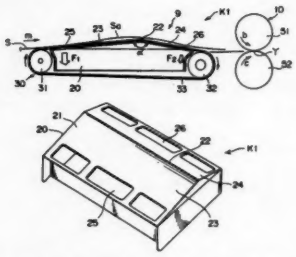
Takayuki Ariyama, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1990, Ser. No. 595,248

Claims priority, application Japan, Oct. 13, 1989, 1-266660; Aug. 10, 1990, 2-212188

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—312 **12 Claims**



1. An image forming apparatus comprising:

an image forming means for forming a toner image on a photosensitive member;

a transfer means for transferring the toner image on said photosensitive member to a recording paper sheet;

a fixing means for fixing the toner image on the recording paper sheet, onto the recording paper sheet, which is so provided as to be spaced a predetermined distance from said transfer means;

a guide member which has a first inclined face for obliquely upwardly guiding the recording paper sheet having the toner image transferred thereto by said transfer means and a second inclined face for obliquely downwardly guiding to said fixing means, the recording paper sheet guided above the first inclined face;

the first inclined face being formed with a first suction opening, while the second inclined face is formed with a second suction opening;

a transport belt means for transporting the recording paper sheet to said fixing means along the first and second inclined faces, which is wound along the first and second inclined faces and is formed with a plurality of holes; and

a suction means which sucks air above the first inclined face through the holes of said transport belt means and the first suction opening and sucks air above the second inclined face through the holes of said transport belt means and the second suction opening so as to bring the recording paper sheet into close contact with said belt above said first and second inclined faces, respectively.

5,063,416

ELECTROPHOTOGRAPHIC PRINTER USING A CONTINUOUS-FORM RECORDING SHEET

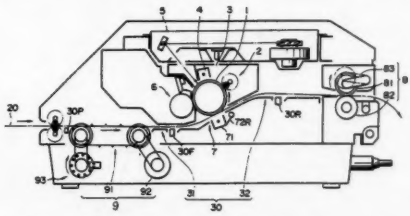
Ryoji Honda, Asaka; Masahiro Kita, Tokyo, and Ikuo Negoro, Sakado, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1990, Ser. No. 535,477

Claims priority, application Japan, Jun. 13, 1989, 1-149976; Apr. 26, 1990, 2-111210

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—316 **30 Claims**



16. A printing process employed in a printing device utilizing an electrophotographic system, capable of employing at least a continuous-form recording sheet having a plurality of printing segments on which an image is to be formed, each of said segments defined by a plurality of perforations provided on said continuous-form recording sheet at a predetermined interval, and comprising:

forming an image on said continuous-form recording sheet;

fixing the image formed on said continuous-form recording sheet;

locating a trailing end of a segment on which forming has been completed, at a predetermined position following a position at which fixing is performed; and

locating the trailing end at a position at which the forming is executed, whereby a leading edge of the next succeeding segment is located at said position at which the forming is performed.

5,063,417

MOLECULAR SHIFT REGISTER BASED ON ELECTRON TRANSFER

John J. Hopfield, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

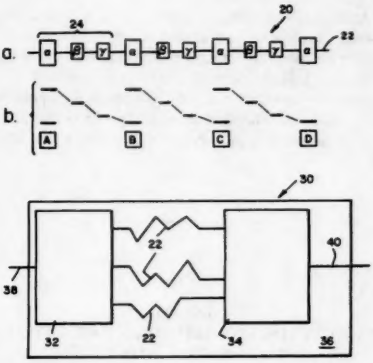
Filed Jul. 18, 1988, Ser. No. 221,021

Int. Cl.[5] H01L *29/28*

U.S. Cl. 357—8 **20 Claims**

1. An electronic shift register comprising (a) a plurality of molecular devices formed on a semiconductor substrate which also supports a VLSI circuit, to which said molecular devices are electrically and logically connected, said molecular devices comprising a polymer made up of a plurality of monomeric

repeat units, each monomeric repeat unit comprising at least three different monomers, with at least one monomer characterized by an electron energy level having a ground state and an upper state to which electrons may be excited and at least one of the remaining monomers characterized by an electron



energy level having a ground state only to permit movement of an electron in a predetermined direction, and (b) pulsed light means for exciting an electron to said upper state when light is one and for permitting said electron to decay to a ground state of an adjacent monomer when light is off.

5,063,418

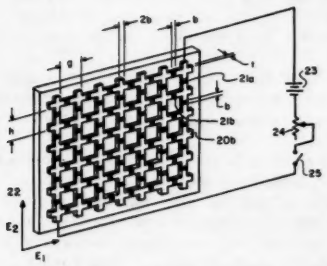
OPTICAL NON-LINEAR ARTIFICIAL DIELECTRICS

Richard R. Shurtz, II, Oakton; Edward J. Sharp, Fredericksburg, and James E. Miller, Woodbridge, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1989, Ser. No. 430,685

Int. Cl.[5] H01L *29/48, 39/22;* **G02B** *5/23;* **G02F** *1/01*

U.S. Cl. 357—15 **26 Claims**



1. A non-linear artificial dielectric structure responsive to a change in intensity of input radiation to effect a change in the optical index of refraction therein, comprising:

a planar substrate composed of a material exhibiting an optical transparency characteristic at the optical frequency of the input radiation;

a metal lattice network arranged to have a repeatable pattern incident with the input surface of the planar substrate and fabricated of arrayed conductive unit cells having dimensions on the order of $2\lambda/3n$ or less, where λ is the wavelength and n is the substrate index of refraction, which should be the lowest possible, wherein the width of the conductive cell is selected to be in the order of one tenth the unit cell length, and the unit cell thickness should exceed approximately two optical skin depths in order to behave as a metal;

a plurality of non-linear elements incorporated into said metal lattice network by interconnecting various arrayed conductive unit cells in a manner to achieve a non-linear interaction within the resulting artificial dielectric structure effected by the flow of field induced currents therein.

5,063,419

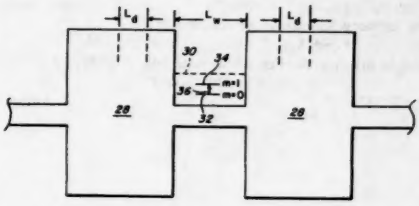
HETEROSTRUCTURE DEVICE USEABLE AS A FAR INFRARED PHOTODETECTOR

Evan R. Glaser, and Benjamin V. Shanabrook, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 15, 1988, Ser. No. 271,546

Int. Cl.[5] H01L *29/161, 29/205, 29/225, 27/12*

U.S. Cl. 357—16 **10 Claims**



1. A heterostructure comprising:

at least two barrier layers doped with doping impurities that provide charge carriers;

at least one well layer disposed between said at least two barrier layers;

wherein the width of said at least two barrier layers, the width of said well layer, and the mean distance of said doping impurities from said at least one well layer, are effective to permit charge carriers in said at least one well layer to be Coulomb bound to said doping impurities a sufficient amount to lower said charge carriers in energy below the conduction band of said well to the impurity substate having quantum number m=0.

5,063,420

METHOD FOR MAKING AN LED ARRAY

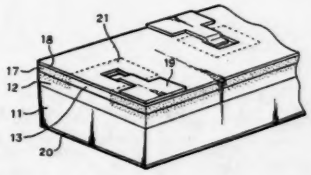
Ki-Joon Kim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 24, 1989, Ser. No. 440,673

Claims priority, application Rep. of Korea, Nov. 17, 1988, 1988-15121

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 **35 Claims**



1. A light emitting diode array formed over a semiconductor substrate, comprising:

a luminescent layer of a first conductivity type and a transparent layer of a second conductivity type, said layers forming a heterogeneous P-N junction over said semiconductor substrate;

a cap layer of the second conductivity type over said trans-

parent layer of the second conductivity type containing impurities for improving electrical contact with an electrode of the second conductivity type;

a diffusion region of the first conductivity type formed spaced apart from said cap layer, inside said transparent layer of the second conductivity type for dividing said transparent layer into a plurality of elements;

an insulating film formed over an entire surface of said transparent layer except said cap layer of the second conductivity type and, next, a second electrode over said cap layer; and

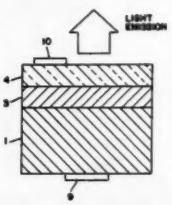
a common electrode of the first conductivity type placed under said semiconductor substrate of the first conductivity type.

5,063,421

SILICON CARBIDE LIGHT EMITTING DIODE HAVING A PN JUNCTION

Akira Suzuki, Nara; Katsuki Furukawa, Sakai; Mitsuhiro Shigeta, Joyo, and Yoshihisa Fujii, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Aug. 7, 1989, Ser. No. 390,600
Claims priority, application Japan, Aug. 8, 1988, 63-197500
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 3 Claims



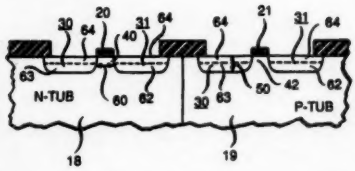
1. A silicon carbide light emitting diode having a pn junction, comprising a semiconductor substrate, a first silicon carbide single-crystal layer of one conductivity formed on said substrate, and a second silicon carbide single-crystal layer of the opposite conductivity formed on said first silicon carbide layer, said first and second silicon carbide layers constituting the pn junction, wherein at least one of said first and second silicon carbide layers contains a tetravalent transition element as a luminescent center.

5,063,422

DEVICES HAVING SHALLOW JUNCTIONS

Steven J. Hillenius, Summit; Joseph Lebowitz, Watchung; Ruichen Liu, Warren, and William T. Lynch, Summit, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 209,149, Jun. 20, 1988, abandoned.
This application Apr. 26, 1990, Ser. No. 515,550
Int. Cl.[5] H01L *29/10, 27/02, 23/48*
U.S. Cl. 357—23.3 10 Claims



1. An article comprising a silicon substrate having an N-tub and a P-tub each of which includes one or more corresponding p-channel MOS and n-channel MOS devices, respectively,

each such p-channel device having a p-type conductivity drain junction dopant region which forms a pn junction with the N-tub,

a metal silicide layer contacting the drain junction dopant region, whereby an interface is formed between the metal silicide layer and the drain junction dopant region,

said drain junction dopant region having an average depth, measure between said interface and said pn junction, equal to 1200 Å or less,

said drain junction dopant region having a dopant concentration which is highest at said interface,

the drain junction dopant region having an activation energy of reverse leakage current across its pn junction,

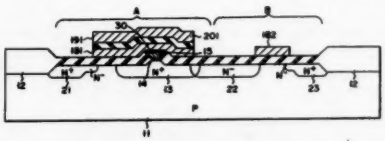
the dopant concentration in the drain junction dopant region being such that the activation energy of reverse leakage current across said pn junction is less than about 0.85 eV.

5,063,423

SEMICONDUCTOR MEMORY DEVICE OF A FLOATING GATE TUNNEL OXIDE TYPE

Tetsuo Fujii, Toyohashi; Minekazu Sakai, Aichi, and Akira Kuroyanagi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 344,605, Apr. 28, 1989, Pat. No. 5,017,979. This application Aug. 15, 1990, Ser. No. 567,760
Int. Cl.[5] H01L *29/68, 29/34, 29/78;* G11C *17/00*
U.S. Cl. 357—23.5 9 Claims



1. A semiconductor memory device comprising:

a semiconductor substrate;

a tunnel insulating film, formed on the surface of the semiconductor substrate, having a three-layer structure wherein an oxide film is interposed between nitrided oxide films;

a gate oxide film which is put in direct contact with the surface of the semiconductor substrate, and which extends outwards from a peripheral portion of the tunnel insulating film;

a floating gate on the tunnel insulating film, said floating gate being divided at least into a first region and a second region, said first region having a low impurity-concentration and being situated in contact with the tunnel insulating film, and said second region having an impurity-concentration higher than that of the first region;

a film interposed between the first and second regions of the floating gate, said film having a such thickness that the film prevents diffusion of an impurity from the second region into the first region and enables the movement of carriers between the first and second regions; and

a control gate formed above the floating gate with the insulating layer interposed between, said control gate, when supplied with a voltage, allowing carriers for data storage to flow from the semiconductor substrate into the floating gate through the tunnel insulating film,

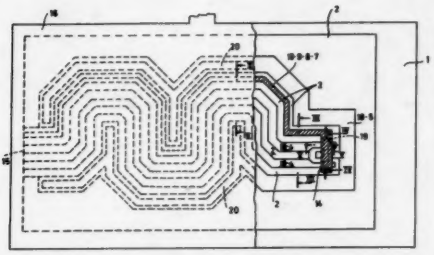
wherein said tunnel insulating film, said floating gate and said control gate form a semiconductor device, and a region including the gate oxide film forms a MOS transistor.

5,063,424

UPROM MEMORY CELL INTEGRABLE WITH A TABLECLOTH MATRIX EPROM

Massimo Melanotte, Milan, and Orio Bellezza, Curno, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Agrate Brianza, Italy

Filed Apr. 4, 1990, Ser. No. 503,931
Claims priority, application Italy, Apr. 10, 1989, 20083 A/89
Int. Cl.[5] H01L *29/68, 29/78, 27/01, 29/00*
U.S. Cl. 357—23.5 **6 Claims**



1. An UPROM memory cell for table-cloth matrix of EPROM memory cells, comprising a semiconductor device enclosed in an ultraviolet ray protecting casing provided with a lateral access, said semiconductor device comprising a semiconductor substrate, parallel source and drain lines alternated with each other in a substrate surface, field oxide areas interposed between and self-aligned with said source and drain lines exception being made for an uncovered active area of the substrate surface arranged far from said casing access and extending transversally to said source and drain lines, floating gate areas interposed between said source and drain lines at said active area and provided with lateral extensions placed on said field oxide areas, dielectric and barrier polysilicon areas superimposed on and self-aligned with said floating gate areas and said lateral extensions thereof, and a control gate line superimposed on and self-aligned with said barrier polysilicon areas to electrically connect them to each other, said source and drain lines and said control gate line extending in substantially parallel way from said active area to said casing access along a labyrinth path preventing any entering ultraviolet rays from reaching said active area.

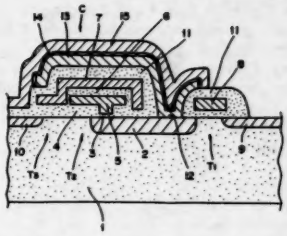
5,063,425

SEMICONDUCTOR MEMORY DEVICE WITH CAPACITOR OVER NON-VOLATILE MEMORY CELL GATE STRUCTURE

Yoshimitsu Yamauchi, Nara, and Keizo Sakiyama, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1990, Ser. No. 481,179
Claims priority, application Japan, Feb. 23, 1989, 1-44143
Int. Cl.[5] H01L *29/78, 29/44*
U.S. Cl. 357—23.6 **15 Claims**

1. A semiconductor memory device, comprising:
a semiconductor substrate;
means for providing a volatile semiconductor storage;
means for providing a nonvolatile semiconductor storage;
means for controlling said volatile and nonvolatile semiconductor storage means so as to store data in either one of said volatile and nonvolatile semiconductor storage means; and
a capacitor that is provided in association with said nonvolatile semiconductor storage means for storing data therein, said capacitor being formed in a stock structure such that a data storage node formed by a polysilicon layer is held in ohmic contact with a drain area of said nonvolatile semiconductor storage means, an insulation film and a capacitor electrode layer being sequentially laminated one over the other on said nonvolatile semiconductor storage means so that said capacitor is formed over a control gate



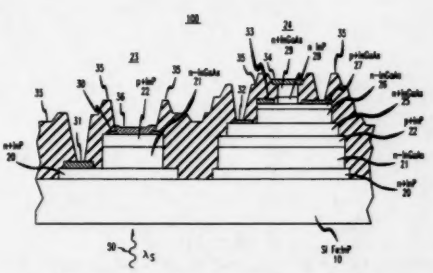
and a floating gate of said nonvolatile semiconductor storage means.

5,063,426

INP/INGAAS MONOLITHIC INTEGRATED PHOTODETECTOR AND HETEROJUNCTION BIPOLAR TRANSISTOR

S. Chandrasekhar, Matawan, and Bartley C. Johnson, Cranbury, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 30, 1990, Ser. No. 559,818
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 **10 Claims**



1. A monolithic integrated photoreceiver comprising:
a non-patterned semi-insulating InP substrate;
a first mesa structure formed on said substrate including a first plurality of InP/InGaAs semiconductor layers for forming a p-i-n photodiode; and
a second mesa structure formed on said substrate including a second plurality of InP/InGaAs semiconductor layers deposited over a third plurality of InP/GaAs semiconductor layers, wherein said second plurality of InP/InGaAs semiconductor layers forms a heterostructure bipolar transistor, said first, second and third pluralities of InP/InGaAs semiconductor layers being deposited by a substantially uninterrupted epitaxial growth process, and said first plurality of InP/InGaAs semiconductor layers being substantially identical to said third plurality of InP/InGaAs semiconductor layers.

5,063,427

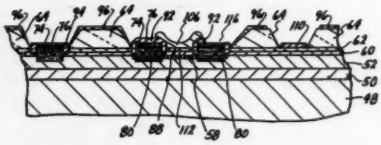
PLANAR BIPOLAR TRANSISTORS INCLUDING HETEROJUNCTION TRANSISTORS

John W. Tully, Rolling Hills Estates; Benedict B. O'Brien, Manhattan Beach; William Hant, Los Angeles, and King L. Hu, Torrance, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Continuation of Ser. No. 234,995, Aug. 22, 1988, abandoned, which is a division of Ser. No. 107,617, Oct. 13, 1987, Pat. No. 4,839,303. This application Mar. 7, 1990, Ser. No. 490,012

Int. Cl.[5] H01L *29/72, 29/161, 29/205*

U.S. Cl. 357—35 28 Claims



11. A fully planar bipolar transistor comprising:

a semiconductor substrate,

a first layer epitaxially grown on said substrate to form a collector,

a base formed at said collector,

a second layer epitaxially grown on said collector and said base, said second layer forming a first surface at the interface with said first layer and second surface spaced away from said first surface,

each of said layers and said base being made of doped Group III–V materials;

a base contact implated into said second layer to extend from the second surface of the second layer to the base,

said base contact being formed into a closed ring surrounding and defining an isolated emitter in said second layer,

an emitter contact formed on said second surface of said second layer at said emitter, and

a collector contact formed on said second surface of the said second layer outside said base contact for electrical connection to said collector.

5,063,428

SEMICONDUCTOR ELEMENT HAVING A P-ZONE ON THE ANODE SIDE AND AN ADJACENT, WEAKLY DOPED N-BASE ZONE

Heinrich Schlangenotto, Neu-Isenburg, and Karl H. Sommer, Warstein, both of Fed. Rep. of Germany, assignors to eupec Europiische Gesellschaft für Leistungshalbleiter mbH & Co. KG, Warstein-Belecke, Fed. Rep. of Germany

PCT No. PCT/EP87/00544, § 371 Date Jun. 10, 1988, § 102(e) Date Jun. 10, 1988, PCT Pub. No. WO88/02555, PCT Pub. Date Apr. 7, 1988

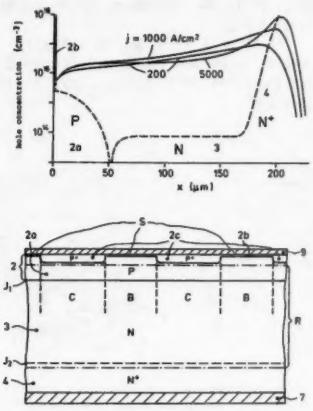
PCT Filed Sep. 25, 1987, Ser. No. 210,517

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633161

Int. Cl.[5] H01L *29/74, 29/06, 29/88, 27/02*

U.S. Cl. 357—38 20 Claims

1. Semiconductor component having a weakly doped continuous interior p-zone which is provided on its surface with an ohmic contact layer, a weakly doped n-base zone adjacent to said weakly doped p-zone, a highly doped n^+-zone arranged adjacent to said n-base zone, and a plurality of p^+-surface



zones arranged entirely within partial regions of said weakly doped p-zone.

5,063,429

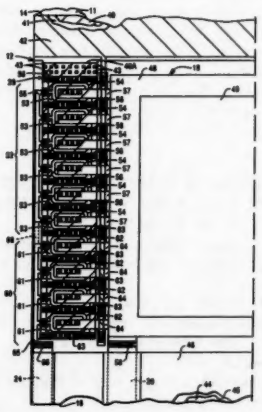
HIGH DENSITY INPUT/OUTPUT CELL ARRANGEMENT FOR INTEGRATED CIRCUITS

Harold S. Crafts, Fort Collins, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 17, 1990, Ser. No. 583,754

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—40 8 Claims



1. An input/output cell arrangement on an integrated circuit substrate, comprising:

a first outer power bus located around a periphery of said integrated circuit substrate on a first layer;

a first inner power bus located within said first outer power bus encompassing an inner portion of said integrated circuit substrate on said first layer;

a second outer power bus located around the periphery on a second layer vertically above said first outer power bus;

a second inner power bus located on said second layer vertically above said first inner power bus;

a plurality of pads located on said integrated circuit substrate

between said outer power buses and said inner power buses; and

a plurality of input/output cells, each connected to a respective pad, also located between the outer power buses and the inner power buses.

5,063,430

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING STANDARD CELLS INCLUDING INTERNAL WIRING REGION

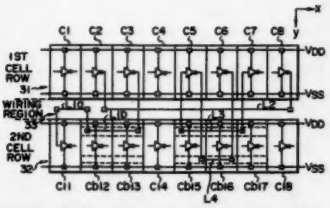
Shojiro Mori, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 476,577, Feb. 7, 1990, abandoned. This application Jan. 30, 1991, Ser. No. 649,139

Claims priority, application Japan, Apr. 27, 1989, 1-108713

Int. Cl.[5] H01L *27/10*

U.S. Cl. 357—45 5 Claims



1. A semiconductor integrated device comprising:

a plurality of standard cell rows extending in a first direction, each row including first standard cells;

a wiring region, which is arranged between two adjacent ones of said standard cell rows and in which cell connection wirings are formed;

wherein at least one said standard cell row includes at least one second standard cell; and

said at least one second standard cell contains an internal wiring region containing a cell connection wiring arranged in said first direction and having two ends, one of said two ends being coupled to one of the wirings formed in said wiring region, and the other of said two ends being coupled to another of the wirings formed in said wiring region; said second cell contains a positive power source line region in which a positive power source line is formed; and said second cell contains a negative power source line region in which a negative power source line is formed.

5,063,431

SEMICONDUCTOR DEVICE HAVING A TWO-LAYER GATE STRUCTURE

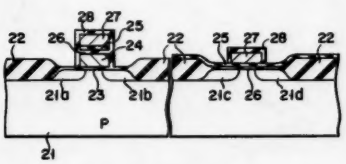
Yohichi Ohshima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1988, Ser. No. 226,098

Claims priority, application Japan, Jul. 31, 1987, 62-191548

Int. Cl.[5] H01L *29/68, 29/34*

U.S. Cl. 357—54 4 Claims



1. A semiconductor device comprising:

a first field oxide layer, formed in a memory cell transistor formation region, and a first gate oxide film of a first transistor, formed in said memory cell transistor formation region;

a floating gate electrode of said first transistor, formed on said first gate oxide film of said first transistor;

a two-layer insulating film consisting of a silicon oxynitride film and a silicon oxide film formed on said floating gate electrode;

a control gate electrode of said first transistor, formed on said two-layer insulating film;

a second field oxide layer of a peripheral circuit transistor formation region and a second gate oxide film of a second transistor, having the same structure as and consisting of the same materials as said two-layer insulating film of said first transistor; and

a gate electrode of said second transistor, formed on said second gate oxide film.

5,063,432

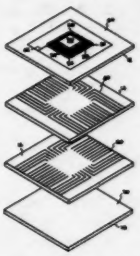
INTEGRATED CIRCUIT LEAD ASSEMBLY STRUCTURE WITH FIRST AND SECOND LEAD PATTERNS SPACED APART IN PARALLEL PLANES WITH A PART OF EACH LEAD IN ONE LEAD PATTERN PERPENDICULAR TO A PART OF EACH LEAD IN THE OTHER LEAD PATTERN

Albert T. Mu, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 354,647, May 22, 1989, abandoned. This application Jul. 16, 1990, Ser. No. 552,351

Int. Cl.[5] H01L *23/48, 29/44, 29/52, 29/60*

U.S. Cl. 357—70 19 Claims



1. An integrated circuit lead assembly structure comprising at least one generally rectangular pc board having a first lead pattern comprising a plurality of leads disposed in a first plane parallel to and adjacent one surface of said pc board and a second lead pattern comprising a plurality of leads disposed in a second plane parallel to said first plane and adjacent the opposite surface of said pc board with at least a part of every lead in said first lead pattern disposed adjacent said one surface of said pc board extending laterally in said first plane perpendicular to corresponding parts of every lead in said second lead pattern extending laterally in said second plane disposed adjacent said opposite surface of said pc board to reduce crosstalk and coupling between said leads in said first lead pattern and said leads in said second lead pattern.

5,063,433

SEMICONDUCTOR DEVICE HAVING MULTI-LAYERED WIRING STRUCTURE

Kenji Matsuo, Yokohama; Tadashi Nonaka, Kawasaki, and Ikuo Tsuchiya, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 13, 1990, Ser. No. 508,692

Claims priority, application Japan, Apr. 26, 1989, 1-104608

Int. Cl.[5] A01L *23/48;* H01L *23/52*

U.S. Cl. 357—71 12 Claims

1. A semiconductor device having a multi-layered structure, comprising:

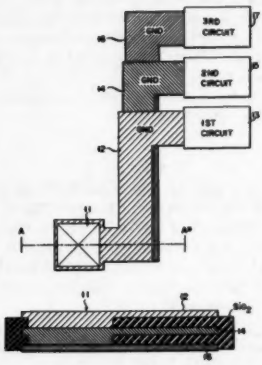
a pad applied with a predetermined potential;

a plurality of circuits each having a predetermined function,

said plurality of circuits including a first circuit and a second circuit, one of said first and second circuits being at least partially analog;

a plurality of lines electrically connecting said pad to said circuits;

an insulating interlayer between said pad and said plurality of circuits for electrically isolating said plurality of lines from each other;



said plurality of lines including a first line electrically connecting a ground terminal of said first circuit to said pad and a second line, located under said first line, electrically connecting a ground terminal of said second circuit to said pad; and

said insulating interlayer being sandwiched between said first line and said second line.

5,063,434

PLASTIC MOLDED TYPE POWER SEMICONDUCTOR DEVICE

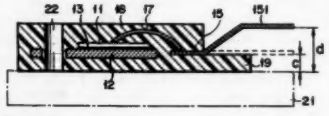
Takao Emoto, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 18, 1990, Ser. No. 584,043

Claims priority, application Japan, Sep. 22, 1989, 1-247268

Int. Cl.[5] H01L *23/28*

U.S. Cl. 357—72 **8 Claims**



1. A plastic molded type power semiconductor device comprising:

a heat dissipation member of a metal having heat conductivity:

a semiconductor chip, mounted on the heat dissipation member so as to conduct heat to the heat dissipation member, the semiconductor chip including a heat generating semiconductor element, and terminals;

lead members, each electrically connected to one of the terminals;

a sealing plastic body including a side surface, a lower surface, and a main body disposed around the heat dissipation member, the semiconductor chip, and the lead members, the main body including a plastic sealing material;

outer leads, each connected to a respective one of the lead members, each outer lead including a first outer lead portion, and a second outer lead portion extending from the main body; and

a plastic table integrated with the sealing plastic body, extending from the side surface of the sealing plastic body main body and contacting the outer leads, wherein the second outer lead portions are vertically removed from the plastic table and bent in a direction away from the lower surface of the sealing plastic body.

5,063,435

SEMICONDUCTOR DEVICE

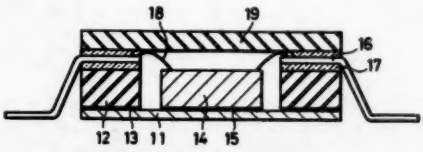
Satoru Okamoto, Hyogo; Kazufumi Terazi, Tokyo; Seiichi Nishino, Tokyo, and Manabu Bonkohara, Tokyo, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and NEC Corporation, Tokyo, both of, Japan

Continuation of Ser. No. 144,092, Jan. 15, 1988, abandoned. This application Nov. 22, 1989, Ser. No. 441,356

Claims priority, application Japan, Jan. 16, 1987, 62-7686

Int. Cl.[5] H01L *73/02*

U.S. Cl. 357—74 **11 Claims**



1. A semiconductor casing having a total thickness no greater than 1.0 mm for use with a semiconductor device having a thin structure which permits transmission of ultraviolet rays to a semiconductor chip within said casing, said casing comprising:

a substrate formed by a thin metal plate having a thickness no more than 0.05 mm on which said semiconductor chip is mounted;

a ceramic frame fixed peripherally to said substrate, said frame having a thickness in a range of from 0.3 to 0.5 mm;

a ceramic cap which covers said semiconductor chip, said cap being mounted on said ceramic frame so as to allow ultraviolet rays therethrough and having a thickness between 0.1 an 0.5 mm; and

leads having a thickness between 0.03 and 0.1 mm sandwiched between said ceramic frame and said ceramic cap which extend outward from said substrate and which are electrically connected to said semiconductor chip.

5,063,436

PRESSURE-CONTACTED SEMICONDUCTOR COMPONENT

Horst Grüning, Baden, and Helmut Keser, Birr, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Continuation of Ser. No. 459,314, Dec. 29, 1989, abandoned. This application Feb. 27, 1991, Ser. No. 660,988

Claims priority, application Switzerland, Feb. 2, 1989, 358/89

Int. Cl.[5] H01L *29/74, 23/48, 29/40, 23/42*

U.S. Cl. 357—79 **8 Claims**

1. A pressure-contacted power-semiconductor component comprising:

a substantially disk-like semiconductor substrate having an anode side surface and a cathode side surface;

a series of differently doped layers positioned inside said semiconductor substrate between said anode side surface and said cathode side surface, and forming a field-controlled thyristor;

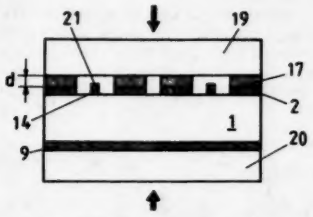
said field-controlled thyristor having, on said cathode side, a large number of cathode fingers, which are elongate with a first length in one direction, and which project out of a deeper-lying gate level;

an anode contact in the form of a metallization layer extend-

ing on said anode side surface of said semiconductor substrate;

a cathode contact extending over said cathode fingers on said cathode side surface of said semiconductor substrate;

an anode compression plate and a cathode compression plate, respectively positioned at said anode and cathode contacts, between which said semiconductor substrate, with said anode and cathode contacts, is positioned and held by clamping; and



a thin metal foil arranged between said cathode-side compression plate and said cathode contact, said thin metal foil being soldered to said cathode contact over an entire surface thereof to provide homogeneous pressure distribution, wherein said metal foil is constructed in the form of a fine screen with a large number of screen holes distributed over a surface thereof, the holes being filled with solder so that pressure of the compression plates is transmitted from the foil substantially directly onto the substrate.

5,063,437

METHOD AND APPARATUS FOR PROCESSING A COLOR VIDEO SIGNAL

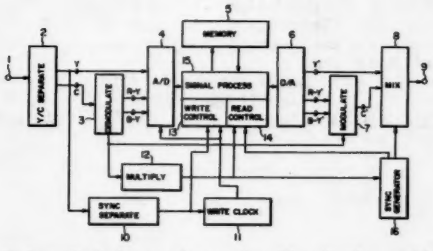
Hitoaki Owashi, Katsuta; Hiroyasu Ohtsubo, Yokohama; Masataka Sekiya, Mito; Kohji Misabe; Hideo Nishijima, both of Katsuta; Michio Masuda, Yokohama, and Morito Rokuda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,402

Claims priority, application Japan, Apr. 30, 1988, 63-105401; Aug. 5, 1988, 63-194635

Int. Cl.[5] H04N 9/64

U.S. Cl. 358—22 **24 Claims**



1. A method of processing a color video signal comprising the steps of:

separating a composite color video signal into a luminance signal and a chrominance signal;

producing a color subcarrier;

demodulating the separated chrominance signal into color difference signals;

storing the separated luminance signal and the color difference signals in memory means;

reading out the stored luminance signal and color difference signals from said memory means in units of one-field period, said field period being adjusted to be extended or shortened in length in reading out said memory means thereby to fix the phase relation between a residual chrominance signal component in the luminance signal read out of said memory means and a chrominance signal which is produced by modulating the color subcarrier with color difference signals read out of said memory means;

performing an intended signal processing for the signals read out of said memory means;

modulating the color subcarrier with processed color difference signals to produce the chrominance signal; and

mixing the chrominance signal with the processed luminance signal to produce a composite color video signal.

5,063,438

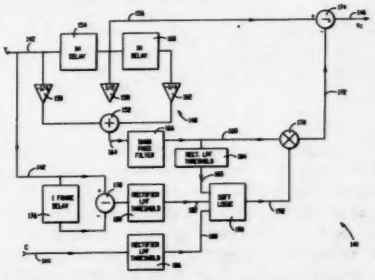
THREE DIMENSIONAL ENCODING SYSTEM FOR COLOR TELEVISION

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Filed Apr. 20, 1990, Ser. No. 511,644

Int. Cl.[5] H04N 9/78

U.S. Cl. 358—31 **14 Claims**



1. A method for controlling the operation of a luminance comb filter in a color television system including the steps of:

chrominance-type comb filter processing of at least that portion of a luminance component of a quadrature modulated color subcarrier television signal interleaved in the spectrum of the color subcarrier pass band and band pass filtering the luminance component to limit it to the spectrum of said color subcarrier pass band to provide a band pass filtered and combined luminance component,

subjecting the band pass filtered and combed luminance component to a composite control which controls output of said band pass filtered and combed luminance component,

generating the composite control by the steps of generating a motion control component as a function of motion present in the television signal and generating a chroma control component as a function of amplitude of a chroma component of the quadrature modulated color subcarrier television signal, and

subtracting said band pass filtered and combed luminance component as passed by said composite control from a delay matched original luminance component to provide a combed original luminance component whenever said band pass filtered and combed luminance component is passed, and to provide a non-combed original luminance component whenever said band pass filtered and combed luminance component is not passed.

5,063,439

SOLID STATE PICKUP SYSTEM HAVING IMPROVED COLOR REPRODUCIBILITY

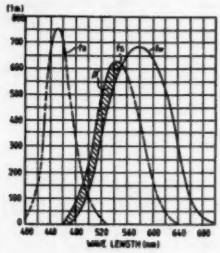
Masatoshi Tabei, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

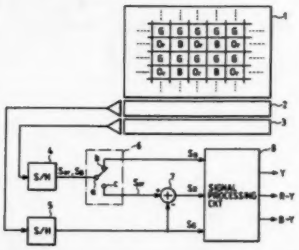
Filed Jun. 7, 1990, Ser. No. 534,563

Claims priority, application Japan, Jun. 8, 1989, 1-143971; Jul. 24, 1989, 1-188844; Aug. 16, 1989, 1-210195

Int. Cl.[5] H04N *9/07*

U.S. Cl. 358—41 **11 Claims**





1. A solid state pickup system in which an image is picked up by a plurality of photodetector elements for producing respective complementary color signals corresponding to stimulus values of respective colors in a complementary color system, and in which primary color signals in a three primary color (RGB) system are derived from said complementary color signals and are applied as inputs to a composing processing means which performs a color mixture operation thereby to realize color reproduction, said pickup system further comprising:

another photodetector element having a spectral sensitivity corresponding to a spectral area of an intermediate color between blue (B) and green (G) in said three primary color (RGB) system; and

first subtracting means for subtracting a signal, produced in said other photodetector element, from said complementary color signals at a predetermined rate to form a new red (R') color signal which is applied as an input to said composing processing means.

5,063,440

STILL/MOVING PICTURE SELECTION CONTROL CIRCUIT FOR VIDEO PHONE SYSTEM

Sam P. Hong, Kyungsangbook, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 30, 1990, Ser. No. 559,165

Claims priority, application Rep. of Korea, Jul. 31, 1989, 11264/1989

Int. Cl.[5] H04N *7/14*

U.S. Cl. 358—85 **6 Claims**

1. A still/moving picture selection control circuit for a video phone system comprising:

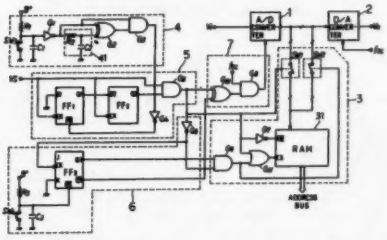
an analog/digital converter for converting input video signals to digital signals synchronized with a subcarrier frequency signal;

a digital/analog converter for converting and outputting the output signals of the analog/digital converter to analog signals synchronized with the subcarrier frequency signal;

a still selection unit for outputting pulse signals in response to the closing of a still switch;

a single-frame signal generating unit for generating single-frame signals synchronized with a vertical synchronizing signal when pulse signals are output from the still selection unit;

a moving picture signal generating unit for continuously outputting moving picture control signals in response to the closing of a moving picture switch and for stopping the output of moving picture control signals by the single-frame signals of the single-frame signal generating unit;



a still/moving picture control unit for applying the subcarrier frequency signal to the analog/digital converter only when the single-frame signals are output from the single-frame signal generating unit or the moving picture control signals are output from the moving picture signal generating unit; and

a memory section for storing the output signals of the analog/digital converter in a RAM when the single-frame signals are output from the single-frame signal generating unit and for applying the signals stored in the RAM to the digital/analog converter when the single-frame signals are not output from the single-frame signal generating unit and the moving picture control signals are not output from the moving picture signal generating unit.

5,063,441

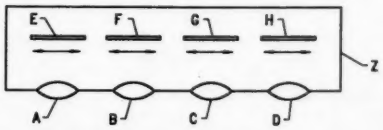
STEREOSCOPIC VIDEO CAMERAS WITH IMAGE SENSORS HAVING VARIABLE EFFECTIVE POSITION

Lenny Lipton, Greenbrae, and Lawrence D. Meyers, Mill Valley, both of Calif., assignors to StereoGraphics Corporation, San Rafael, Calif.

Filed Oct. 11, 1990, Ser. No. 595,595

Int. Cl.[5] H04N *13/00*

U.S. Cl. 358—88 **24 Claims**



1. A stereoscopic video camera, including:

a housing;

a left lens having a first optical axis and a right lens having a second optical axis, wherein the left lens and the right lens are fixedly mounted in the housing with the first optical axis substantially parallel to the second optical axis;

a left image sensor mounted in the housing along the first optical axis and a right image sensor mounted in the housing along the second optical axis; and

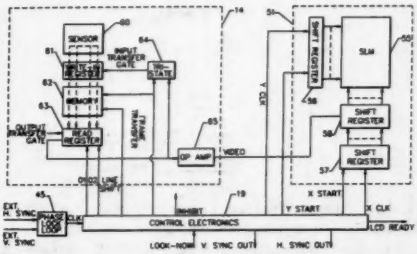
means for controlling the effective position of a first one of the left image sensor and the right image sensor to selectively expose said first one of the left image sensor and the right image sensor to different portions of an image focused by a corresponding one of the left lens and the right lens.

5,063,442

IMAGE CONVERTER

Roeland M.T. Hekker, Fairfield, Iowa, and Ishak M. Livny, San Jose, Calif., assignors to E. I. DuPont de Nemours & Company, Wilmington, Del.

Filed Feb. 6, 1990, Ser. No. 475,928
Int. Cl.[5] H04N 7/18
U.S. Cl. 358—93 47 Claims



1. An image conversion method for converting a coherent image to one of a coherent image and an incoherent image, comprising the steps of:

providing a first coherent two dimensional electromagnetic radiation image;

converting said first coherent two dimensional electromagnetic radiation image into a digital signal;

applying said digital signal to a two dimensional spatial light modulator; and

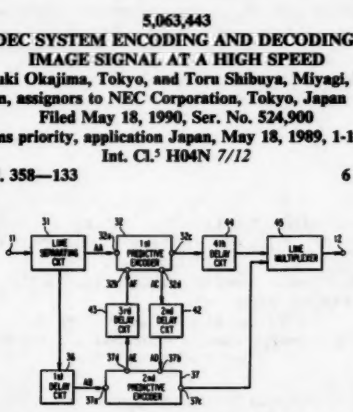
impinging one of coherent and incoherent electromagnetic radiation onto said two dimensional spatial modulator to produce a corresponding second one of a coherent and an incoherent two dimensional electromagnetic radiation image from said first coherent two dimensional electromagnetic radiation image.

5,063,443

CODEC SYSTEM ENCODING AND DECODING AN IMAGE SIGNAL AT A HIGH SPEED

Masayuki Okajima, Tokyo, and Toru Shibuya, Miyagi, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 18, 1990, Ser. No. 524,900
Claims priority, application Japan, May 18, 1989, 1-125634
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—133 6 Claims



1. A predictive encoding device operable in response to an input image signal to encode said input image signal into an output encoded signal, said input image signal being divisible into an odd number line signal and an even number line signal, said predictive encoding device comprising:

line separating means responsive to said input image signal for separating said input image signal into said odd number line signal and said even number line signal;

first predictive encoding means coupled to said line separating means and responsive to a selected one of said odd and said even number line signals for carrying out predictive encoding of said selected one of the odd and the even number line signals to produce a first encoded signal and a first local decoded signal;

first delay means coupled to said line separating means for delaying a remaining one of said odd and said even number line signals to produce a delayed line signal;

second predictive encoding means responsive to said delayed line signal for carrying out predictive encoding of said delayed line signal to produce a second encoded signal and a second local decoded signal;

second delay means coupled to said first predictive encoding means and responsive to said first local decoded signal for delaying the first local decoded signal to supply said second predictive encoding means with a first delayed local decoded signal and to make said second predictive encoding means carry out said predictive encoding on the basis of said first delayed local decoded signal;

third delay means coupled to said second predictive encoding means for delaying said second local decoded signal to supply said first predictive encoding means with a second delayed local decoded signal and to make said first predictive encoding means carry out said predictive encoding on the basis of said second delayed local decoded signal;

fourth delay means coupled to said first predictive encoding means and responsive to said first encoded signal for delaying said first encoded signal in relation to said second encoded signal to produce a first delayed encoded signal; and

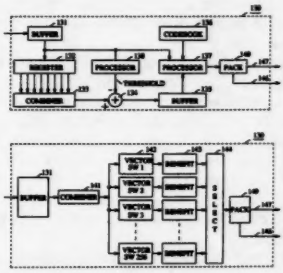
multiplexing means for multiplexing said first delayed encoded signal and said second encoded signal to alternatingly produce the first delayed encoded signal and said second encoded signal as said output encoded signal.

5,063,444

HIGH DEFINITION TELEVISION ARRANGEMENT WITH SIGNAL SELECTIONS ADAPTED TO THE AVAILABLE TRANSMISSION CAPACITY

Scott C. Knauer, Mountainside; Arun N. Netravali, Westfield; Eric D. Petajan, Millburn; Robert J. Safranek, New Providence, and Peter H. Westerink, Millburn, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 19, 1990, Ser. No. 495,523
Int. Cl.[5] H04N 7/13, 7/133, 7/137
U.S. Cl. 358—133 23 Claims



1. A method for developing a video signal for a frame interval of a video camera observing an image, comprising the steps of:

responsive to a signal developed by said video camera, developing a plurality of video samples of a frame for transmitting during said frame interval,

when said step of developing produces a plurality of video

samples in excess of the number of samples that can be transmitted in said frame interval, selecting from said plurality of video samples only a subset of said samples to be transmitted that, when transmitted, occupies essentially a predefined fraction of said frame interval wherein the selection is based on the relative value of the selected samples to the image quality, and

conditioning said subset of samples for transmission.

5,063,445

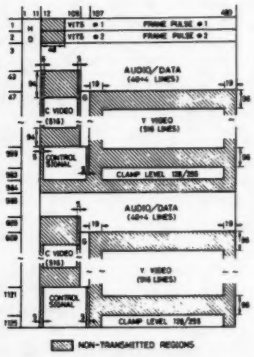
MULTIPLE SUB-SAMPLING TRANSMITTING/RECEIVING SYSTEM PERFORMING INTERFIELD AND INTERFRAME OFFSET SUB-SAMPLING OF A BROAD BANDWIDTH TELEVISION SIGNAL

Taiji Nishizawa; Yutaka Tanaka; Seiichi Gohshi; Junji Kumada; Yuichi Iwadate; Kazuhiko Shibuya; Toshihiko Susaki; Yukihiro Nishida; Minoru Honda; Taiichiro Kurita; Yoshinori Izumi; Makoto Okui; Isao Kondo; Ryoichi Yajima, and Jun'ichi Ishida, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,374

Int. Cl.[5] H04N 7/12

U.S. Cl. 358—138 **55 Claims**



1. An encoder for converting a second television signal into a third television signal, said second television signal being a broad bandwidth television signal having greater number of horizontal scanning lines and broader frequency bandwidth than those of a first television signal, said third television signal being a narrow bandwidth multiple sub-sampled time division multiplexed television signal the bandwidth of which is substantially equal to that of the first television signal, said encoder comprising:

multiple sub-sampling encoding means for converting, with bandwidth compression, a fourth television signal into a fifth television signal by using the multiple sub-sampling time division multiplexing technique, said fourth television signal having a greater number of horizontal scanning lines and broader frequency bandwidth than those of said second television signal, said fifth television signal having broader bandwidth than that of said first television signal and narrower bandwidth than that of said fourth television signal;

first converting means for converting said second television signal inputted to said first converting means into a sixth television signal having a signal format conforming to that of said fourth television signal, and for supplying the converted signal to said multiple sub-sampling encoding means; and

second converting means for converting said fifth television signal outputted from said multiple sub-sampling encoding means into said third television signal.

5,063,446

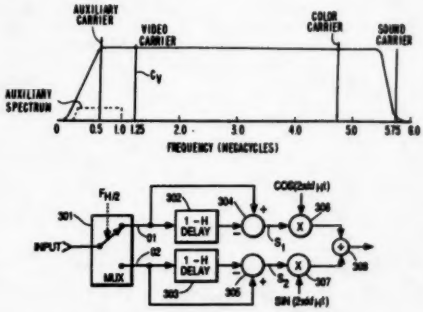
APPARATUS FOR TRANSMITTING AUXILIARY SIGNAL IN A TV CHANNEL

James J. Gibson, Princeton, N.J., assignor to General Electric Company, Princeton, N.J.

Filed Aug. 11, 1989, Ser. No. 392,500

Int. Cl.[5] H04N 7/07, 7/06, 7/04

U.S. Cl. 358—142 **16 Claims**



1. Apparatus for frequency interleaving an auxiliary signal with a television signal, said auxiliary signal having a substantially continuous frequency bandwidth which is greater than a multiple of the horizontal line frequency of said video signal, said apparatus comprising:

means for providing said auxiliary signal and said video signal;

means for providing a horizontal synchronizing signal related to said video signal;

means including means, responsive to said auxiliary signal and said horizontal synchronizing signal, for apportioning said auxiliary signal to generate first and second signals each of which includes a mutually exclusive portion of said auxiliary signal, and includes polarity inverted portions of said auxiliary signal;

means responsive to said first and second signals and said horizontal synchronizing signal for generating a quadrature phase modulated signal; and

means for combining said quadrature phase modulated signal with said video signal.

5,063,447

INFORMATION PROCESSING APPARATUS HAVING A COMMON A/D CONVERTER FOR THE IMAGE AND AUDIO SIGNALS

Nobuhiro Takeda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,970

Claims priority, application Japan, Aug. 23, 1988, 63-207254

Int. Cl.[5] H04N 7/093

U.S. Cl. 358—145 **15 Claims**

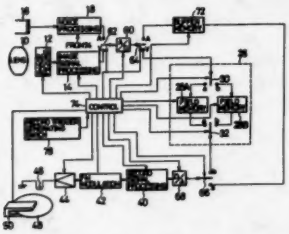
1. An information processing apparatus comprising:

a) first means for supplying an image signal during an effective period and an ineffective period, and an audio signal;

b) common A/D converting means for A/D converting both said image signal and said audio signal;

c) second means for supplying said image signal to said A/D converting means during said effective period and for

supplying said audio signal to the A/D converting means during said ineffective period; and



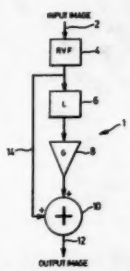
d) memory means for storing the signal which was A/D converted by said A/D converting means.

5,063,448

APPARATUS AND METHOD FOR TRANSFORMING A DIGITIZED SIGNAL OF AN IMAGE

Ian Jaffray, Toronto, and John F. Bronskill, Scarborough, both of Canada, assignors to Imageware Research and Development Inc., Toronto, Canada

Filed Jul. 31, 1989, Ser. No. 387,049
Int. Cl.[5] H04N *5/14*
U.S. Cl. 358—160 **6 Claims**



1. An apparatus, for transforming a digitized signal of an image to give a brush stroke effect, the apparatus comprising: a main input; a first rank value filter having an input for an original digitized signal, connected to the main input of the apparatus; a Laplacian unit having an input connected to an output of the rank value filter and an output; a gain unit with variable gain and connected to the output of the Laplacian unit; a summation unit having one input connected to an output of the gain unit and an output forming an output of the apparatus; and a bypass line connected between the output of the first rank value filter and another input of the summation unit.

5,063,449

SOLID-STATE IMAGE SENSOR EMPLOYING A GATE AND DIODE FOR BIAS CHARGE INJECTION

Hidenori Shibata, Yokohama; Ikuko Inoue, Kawasaki, and Nozomu Harada, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 16, 1989, Ser. No. 437,260
Claims priority, application Japan, Nov. 18, 1988, 63-290148; Jan. 25, 1989, 1-15511; Oct. 16, 1989, 1-266160
Int. Cl.[5] H04N *3/14, 5/335*
U.S. Cl. 358—213.11 **15 Claims**

1. A solid-state image sensor comprising:

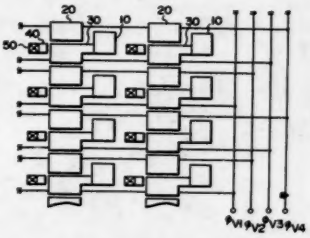
a semiconductor substrate;

a plurality of arrays of signal charge storage diodes formed in said semiconductor substrate;

a plurality of signal charge read-out sections formed neighboring to said arrays of the signal charge storage diodes, in said semiconductor substrate;

a plurality of signal charge transfer sections formed neighboring said signal charge read-out sections in said semiconductor substrate; and

a plurality of bias-charge injecting gates and diodes, provided neighboring to said signal charge transfer sections, for injecting bias charges into said signal charge storage diodes via said signal charge read-out sections;



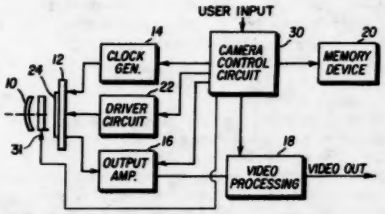
wherein plural pixel electrodes and said signal charge storage diodes are arranged in a matrix form, said signal charge transfer sections comprise a plurality of signal charge transfer arrays arranged in a row along said arranged signal charge storage diodes, said bias-charge injecting gates and diodes are provided in association with said signal charge storage diodes, and after the signal charges are read out from said signal charge storage diodes, said bias charges are injected into all of said signal charge strange diodes for every other row of said signal charge storage diodes.

5,063,450

METHOD AND APPARATUS FOR PREVENTING ALIASING IN AN ELECTRONIC STILL CAMERA

Jeffrey A. Pritchard, Arleta, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 28, 1990, Ser. No. 619,092
Int. Cl.[5] H04N *3/14, 5/335, 5/30, 3/12*
U.S. Cl. 358—213.28 **11 Claims**



1. An image sensor structure comprising: an image sensor device including a plurality of pixel elements arranged in an array; drive means for imparting a controlled two-dimensional motion to said image sensor device; means for controlling an exposure operation of said image sensor device while said drive means is imparting said controlled two-dimensional motion, wherein said controlled two-dimensional motion causes light incident on said image sensor device during said exposure operation to be distributed among neighboring pixel elements of said array to prevent aliasing.

5,063,451

HAND HELD RECORDING APPARATUS WITH WINDOW ON LOWER BODY PORTION FOR VIEWING RECORDING POSITION

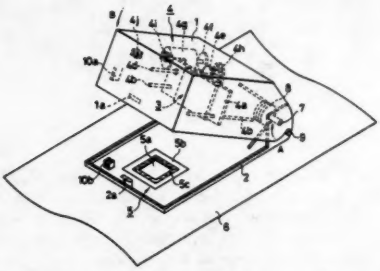
Ryozo Yanagisawa, Matsudo; Hiroshi Tanioka; Kiyoshi Kaneko, both of Yokohama; Toshiaki Harada; Kikuo Yoshikawa, both of Kawasaki; Noboru Koumura, Narashino, and Toshiharu Inui, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1989, Ser. No. 375,981

Claims priority, application Japan, Jul. 11, 1988, 63-170847; Jul. 18, 1988, 63-177047

Int. Cl.[5] B41J *3/39, 2/32, 2/05*

U.S. Cl. 346—143 **24 Claims**



1. A recording apparatus for effecting recording on a recording medium, comprising:

an upper body comprising a recording means for effecting recording on the recording medium in conformity with an image signal, and scanning means for scanning said recording means; and

a lower body having a mounting section for mounting at least a portion of said lower body on at least a portion of the recording medium, said lower body also having a viewing section through which a recording position of said recording means on the recording medium can be viewed,

said upper body and said lower body being relatively movable to opened and closed positions.

5,063,452

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS HAVING MEANS FOR PREVENTING AUDIO-TO-VIDEO CROSSTALK AND NOISE GENERATION

Seiji Higurashi, Fuchu, Japan, assignor to Victor Company of Japan Ltd., Kanagawa, Japan

Continuation of Ser. No. 147,715, Jan. 25, 1988, abandoned. This application Jan. 26, 1990, Ser. No. 478,701

Claims priority, application Japan, Jan. 27, 1987, 62-16762; Oct. 16, 1987, 62-261319

Int. Cl.[5] H04N *5/782*

U.S. Cl. 360—19.1 **18 Claims**

1. A magnetic recording apparatus comprising:

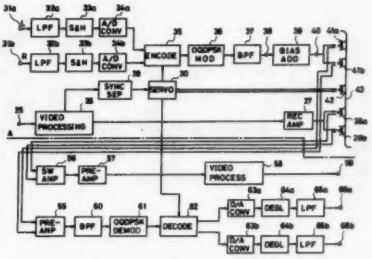
audio signal processing means for converting an input analog audio signal into a digital audio signal;

modulating means for subjecting the digital audio signal to a modulation selected from a multi-phase differential phase shift modulation (DPSK) and an offset-multi-phase differential shift keying modulation (ODPSK) to produce a modulated digital audio signal;

adding means for adding a high-frequency bias signal to the modulated digital audio signal;

audio signal recording means for recording the modulated digital audio signal with the high-frequency bias signal added thereto on an audio track formed in a deep layer portion of a magnetic layer of a magnetic tape; and

video signal recording means for recording an input video signal on a video track formed in a surface layer portion of the magnetic tape, the video track being formed subsequent to the forming of the audio track, the video track being formed and the audio track respectively being formed by corresponding heads having different azimuth angles, said input video signal including a luminance signal and a carrier chrominance signal which is frequency converted into a range lower than that of the luminance signal so that a frequency band of the modulated digital audio is higher than a frequency band of the frequency



converted carrier chrominance, said high-frequency bias signal being added to the modulated digital audio signal in order to prevent a noise caused by a cross modulation distortion generated by the non-linearity of the magnetic tape and the modulated digital audio signal itself, said noise degrading the frequency converted carrier chrominance signal in said range in which the azimuth loss effect is less affected, and said noise being reproduced as a crosstalk from the audio track when the video track is scanned.

5,063,453

DIGITAL SIGNAL RECORDING APPARATUS

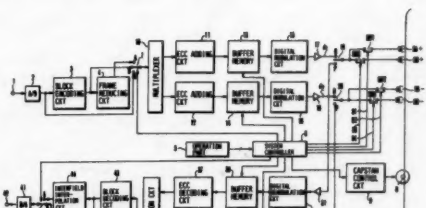
Katsuji Yoshimura, Kanagawa; Akio Aoki, Tokyo; Makoto Shimokoriyama, Kanagawa; Motokazu Kashida, Tokyo; Shinichi Yamashita, and Kenichi Nagasawa, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 200,625, May 31, 1988, abandoned. This application Jan. 28, 1991, Ser. No. 647,683

Claims priority, application Japan, Jun. 8, 1987, 62-143875; Jun. 9, 1987, 62-144748; Jul. 31, 1987, 62-192267

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—32 **20 Claims**



1. A digital information signal recording apparatus comprising:

(a) head means including at least one pair of heads which are arranged to have different azimuth angles and to rotate at adjacent rotating phases to each other;

(b) data compressing means for reducing the amount of digital data;

(c) selection means for selectively producing one of a first digital data sequence to be supplied to said data compress-

ing means and a second digital data sequence outputted by said data compressing means;

(d) signal processing means, arranged to receive the digital data sequence produced from said selection means for supplying two channels of recording signals in parallel to said pair of heads such that a given amount of data is periodically recorded on a recording medium by said pair of heads at a time; and

(e) mode switching means for switching an operation mode of said apparatus between a plurality of modes, including:

a first mode in which said selection means produces the first data sequence and said signal processing means supplies in parallel said head means with the two channels of recording signals including the given amount of data for every given period of time t, and

a second mode in which said selection means produces the second data sequence and said signal processing means supplies in parallel said head means with the two channels of recording signals including the given amount of data for every given period of time nt, wherein "n" represents an integer which is at least 2.

5,063,454

AUTOMATIC ADJUSTMENT METHOD AND SYSTEM FOR SERVO MOTOR CIRCUIT OF A MAGNETIC DISK APPARATUS

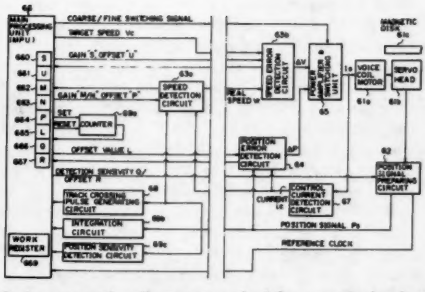
Shuichi Hashimoto, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 3, 1990, Ser. No. 460,657

Claims priority, application Japan, Jan. 10, 1989, 1-003183; Jan. 10, 1989, 1-003184; Jan. 10, 1989, 1-003185; Jan. 10, 1989, 1-003186; Mar. 13, 1989, 1-060472; Mar. 18, 1989, 1-067201

Int. Cl.[5] G11B *5/55, 5/596, 13/00*

U.S. Cl. 360—78.04 **14 Claims**



9. An automatic adjustment method for a servo circuit of a magnetic disk apparatus, the servo circuit including a position signal preparing circuit for detecting a position signal from servo information of a magnetic head which reads the servo information recorded on a servo surface of a magnetic disk, a speed control circuit for performing speed control on a drive source which moves the magnetic head in a seek operation based on the position signal, and a position control circuit for performing position control on the drive source based on the position signal, said method comprising the steps of:

(a) preparing a gate signal by slicing the position signal, while performing the uniform speed seek operation on the magnetic head, and counting a time ratio of the slope portion of the position signal from the gate signal; and

(b) changing the detection sensitivity of the position signal preparing circuit so that the counted time ratio of the slope portion becomes a predetermined value.

5,063,455

MODE SELECTING MECHANISM FOR A TAPE RECORDER

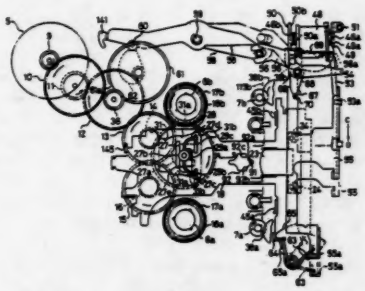
Toshio Yoshimura, Kanagawa, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1989, Ser. No. 410,908

Claims priority, application Japan, Feb. 7, 1989, 1-13339[U]

Int. Cl.[5] G11B *15/18*

U.S. Cl. 360—96.5 **2 Claims**



1. A mode selecting mechanism for a tape recorder capable of actuating a ejector mechanism and a head moving mechanism by utlizing the turning force from a tape transporting motor, which comprises:

(a) a rotation transmitting system having a gear for transmitting the rotation of the tape transporting motor to a pair of reel supports;

(b) a cam gear having a non-toothed section and a cam which engages with the gear in the rotation transmitting system at a position other than the non-toothed section;

(c) a rocking lever engaged with the cam of the cam gear for performing a rocking motion which is coupled to the rotation of the cam gear;

(d) an ejector mechanism capable of ejecting a cassette tape from the reel supports;

(e) an electromagnet for EJECT motion capable of engaging a portion of the ejector mechanism with the rocking lever at the time of conduction and actuating the ejector mechanism by the rocking motion of the rocking lever;

(f) a head moving mechanism capable of moving a magnetic head into PLAY position against the tension of a head-return spring; and

(g) an electromagnet for PLAY motion capable of engaging the head moving mechanism with the rocking lever and moving the head moving mechanism to the operative position by the rocking motion of the rocking lever, and holding the head moving mechanism at PLAY position at the time of conduction;

wherein the non-toothed section of the cam gear is engaged with the gear in the rotation transmitting system when the rotation of the cam gear causes the head moving mechanism to

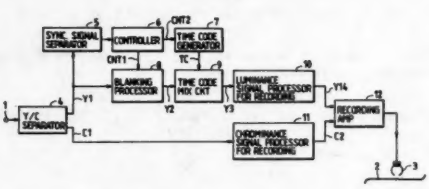
be in the operative position, and when the electromagnet for PLAY is turned off, the return force of the head moving mechanism is transmitted via the rocking lever to the cam gear to enable the cam gear to mesh with the gear in the rotation transmitting system.

5,063,456

VIDEO SIGNAL PROCESSOR

Tadasu Horiuchi, Yokohama; Hideo Nishijima, and Shoji Ohno, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,297
Claims priority, application Japan, Aug. 12, 1988, 63-199829
Int. Cl.[5] H04N *9/79*
U.S. Cl. 358—310 3 Claims



1. A video signal processor comprising:

an input terminal connected to receive a video signal;

a Y/C separator for separating the video signal received at the input terminal into a luminance signal and a chrominance signal and for outputting the luminance signal and the chrominance signal;

a sync signal separator connected to the Y/C separator for extracting a synchronizing signal from the luminance signal output by the Y/C separator;

a blanking processor connected to receive a first control signal and the luminance signal output by said Y/C separator;

a time code generator connected to receive a second control signal for generating a time code;

a controller which is responsive to the synchronizing signal extracted by said sync signal separator for outputting the first control signal for controlling said blanking processor and the second control signal for controlling said time code generator, said controller controlling said blanking processor by way of the first control signal so that said blanking processor removes information signals other than the synchronizing signal from the luminance signal inserted in a vertical blanking period of the received video signal, and further for controlling said time code generator by way of the second control signal so that the time code generated by said time code generator is inserted in the luminance signal from which the information signals have been removed;

a time code mix circuit connected to receive the time code generated by said time code generator and the luminance signal from which the information signals have been removed from said blanking processor for mixing the time code and the luminance signal from which the information signals have been removed, said time code mix circuit outputting a mixed signal resulting from the mixing of the time code and the luminance signal from which the information signals have been removed;

signal processing means for converting the mixed signal and the chrominance signal into signals suitable for recording, respectively, and for outputting the signals suitable for recording; and

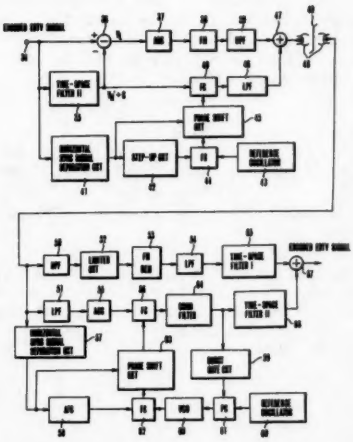
means for amplifying at least one of the signals suitable for recording output by said signal processing means prior to recording said at least one signal.

5,063,457

WIDE-BAND VIDEO SIGNAL RECORDING APPARATUS BY USING FREQUENCY INTERLEAVE

Hisashi Ishikawa, Kanagawa; Susumu Kozuki, Tokyo; Koji Takahashi, and Katsuji Yoshimura, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 121,651, Nov. 17, 1987, abandoned.
This application Sep. 12, 1990, Ser. No. 581,418
Claims priority, application Japan, Nov. 19, 1986, 61-275564; Nov. 20, 1986, 61-278091; Apr. 13, 1987, 62-091457; Apr. 14, 1987, 62-091386; Apr. 27, 1987, 62-104921; Apr. 28, 1987, 62-107008
Int. Cl.[5] H04N *9/82*
U.S. Cl. 358—330 10 Claims



1. A video signal recording apparatus comprising:

a) input means arranged to be capable of selectively receiving a first video signal consisting of a carrier chrominance signal, a low-band luminance signal which is limited to a given low frequency band and a high-band luminance signal which is frequency interleaved with the low-band luminance signal or a second video signal consisting of a luminance signal having a narrower band than the band of said first video signal and a chrominance signal which is frequency interleaved with said luminance signal;

b) a first filter arranged to limit the band of said low-band luminance signal included in said first video signal or that of said luminance signal included in said second video signal;

c) modulating means arranged to frequency modulate the signal which is band limited by said first filter;

d) a second filter arranged to limit the bands of the high-band luminance signal and the chrominance signal included in said first video signal or that of the chrominance signal included in said second video signal;

e) converting means arranged to frequency convert the signal which is band limited by said second filter to the low band of said frequency modulated signal modulated by said modulating means;

f) multiplexing means for multiplexing said frequency converted signal converted by said converting means with said frequency modulated signal;

g) recording means for recording on a recording medium a multiplexed signal obtained by the multiplexing action of said multiplexing means; and

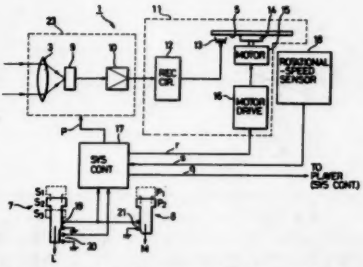
h) discriminating means for making a discrimination as to whether the signal received by said input means is said first video signal or said second video signal.

5,063,458

ELECTRONIC STILL CAMERA WITH STANDBY SWITCHES OPERABLE TO ENABLE THE CAMERA FOR RECORDING AN IMAGE UPON ACTUATION OF A RECORDING SWITCH

Takashi Fukushima, Tokyo, and Takashi Hishinuma, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 407,742
Claims priority, application Japan, Sep. 27, 1988, 63-241594
Int. Cl.[5] H04N *5/781*
U.S. Cl. 358—335 4 Claims



1. In an electronic still camera of the type having image pickup means for receiving an optical image and generating electrical image signals representative thereof, and recording means responsive to a record control signal for recording the image signals on a magnetic medium and which includes a transducer and a spindle motor operable by operating energy from a source thereof for rotatably driving said magnetic medium relative to said transducer; the combination of

first standby switch means actuable for causing said operating energy to be supplied from said source to said spindle motor so as to rotate said magnetic medium and thereby enable said recording means for recording of said image signals on said magnetic medium,

second standby switch means actuable independently of said first standby switch means for causing said operating energy to be supplied from said source to said spindle motor and thereby also enabling said recording means,

recording switch means actuable for causing said record control signal to be supplied to said recording means after enabling thereof by actuation of one of said first and second standby switches for said recording of the image signals on said magnetic medium, and

shutter release means including a common driving element movable from a quiescent position to a first position for actuating one of said first and second standby switch means and further movable from said first position to a second position to actuate said recording switch means.

5,063,459

FACSIMILE APPARATUS

Munehiro Nakatani; Hirokazu Yamada, and Masamichi Kishi, all of Osaka, Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Feb. 21, 1990, Ser. No. 482,880
Claims priority, application Japan, Feb. 23, 1989, 1-44705
Int. Cl.[5] H04M *1/00*
U.S. Cl. 358—404 20 Claims

1. A facsimile apparatus for receiving a data transmitted through a line, the apparatus comprising:

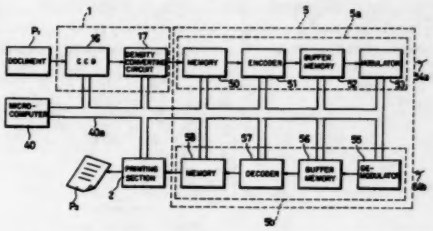
means for storing a data transmitted from memory an addresser;

capacity detecting means for detecting an amount of data stored in said memory means;

image forming means for forming a toner image on a recording paper in accordance with the data;

thermal fixing means for fixing the toner image on the recording paper by heating; and

temperature controlling means for controlling said thermal fixing means to have an operating mode temperature which is high enough to fix the image on the recording



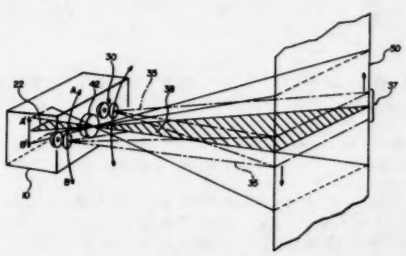
paper in accordance with a detection result of said capacity detecting means.

5,063,460

ELECTRONIC CAMERA FOR LINE-BY-LINE IMAGING OF DOCUMENTS

Ulrich Mutze; Gerhard Quanz, both of Stuttgart, Fed. Rep. of Germany; The A. Vuong, Cleveland Heights, Ohio, and Wolfgang Kiesewetter, Waiblingen-Neustadt, Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 13, 1990, Ser. No. 553,486
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1989, 3923521
Int. Cl.[5] H04N *5/30*
U.S. Cl. 358—474 17 Claims



1. Electronic camera for line-by-line imaging of documents or the like on an elongate solid-state image sensor, in particular a CCD line sensor, said camera comprising an illumination unit provided with optical elements as well as a camera lens, characterized in that for the imaging of large-size documents (50), the illumination unit (30, 130, 230) together with its optical elements (32, 34, 132, 232) is pivotable for producing a light strip (37) on the document (50) and in that the CCD line sensor (22, 122, 222) is movable, in response to said pivotal movement of the illumination unit (30, 130, 230), within the image plane of the lens (42, 142, 244) such that the light strip (37) can be imaged on the CCD line sensor (22, 122, 222).

5,063,461

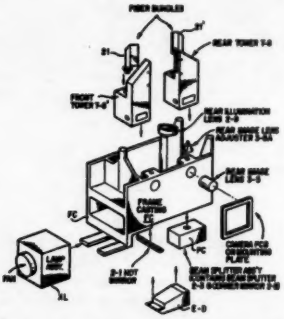
PACKAGING OF COMPONENTS FOR IMAGE LIFT

Gary Copenhaver, Canton; Johan Bakker, Union Lake, and John Vala, Plymouth, all of Mich., assignors to Unisys Corporation (Formerly Burroughs Corp.), Detroit, Mich.

Filed Oct. 10, 1989, Ser. No. 419,045
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—474 21 Claims

1. A method of integrating an array of cooperating optical and thermal components adapted to be used with prescribed transport-imaging means disposed along a prescribed up-pivoting transport-platform with a plurality of coupling-apertures; this method comprising the steps of:

providing a single mount-casting MC carrying prescribed load means and including a plurality of coupling-extensions, each adapted to be co-located with respective one of said coupling apertures under said platform and including mount-site means; providing at one optical-tower unit enclosing and positioning a cooperating array of optical components, each said unit adapted to engage, and be



mounted on, one said mount-site means; providing a heat generating Spectral Radiation Source means arranged and adapted to be attached to said casting MC and providing Heat-Dissipation means disposed in infra-red receiving relation with said Source means and adapted to trap and dissipate this infra-red radiation wherein the Dissipation means is attached to said Source means and said Casting MC.

5,063,462

LED ARRAY AND PARTITIVE DRIVING METHOD THEREFOR USING OVERLAPPING ACTIVATION PERIODS

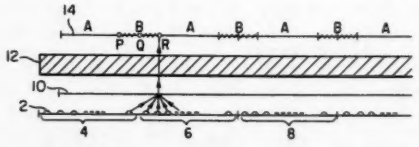
Katsumi Nakagawa; Tatsundo Kawai, and Yasuo Kuroda, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 303,063, Jan. 30, 1989, abandoned, which is a continuation of Ser. No. 135,534, Dec. 17, 1987, abandoned, which is a continuation of Ser. No. 946,178, Dec. 23, 1986, abandoned, which is a continuation of Ser. No. 712,027, Mar. 15, 1985, abandoned. This application Dec. 5, 1989, Ser. No. 445,929

Claims priority, application Japan, Mar. 21, 1984, 59-52338

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—475 **13 Claims**



1. A partitive driving method for an LED array having a plurality of LED blocks each of which can independently be turned on, said method comprising the steps of:

turning on, after the lapse of a time period T1 after a block b is turned on, a succeeding block c;

extinguishing, after the lapse of a time period T2 after the block b is turned on, another block a which has been in a turned on state since the time before said block b was illuminated; and

variably setting the time period T2 in accordance with the output of a line sensor which receives light from the LED array.

5,063,463

LOADING MECHANISM INCLUDING A LINKAGE MECHANISM, AND RECORDING AND/OR REPRODUCING APPARATUS COMPRISING SUCH A LOADING MECHANISM

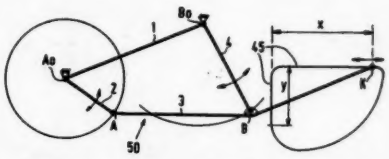
Franciscus A. J. M. Kox, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1989, Ser. No. 325,584

Claims priority, application Netherlands, Mar. 25, 1988, 8800751

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.5 **6 Claims**



1. A loading mechanism for a recording and/or reproducing apparatus (23), which loading mechanism serves to transfer an information carrier (26) supported by a support (25) between a loading position and an operational position, wherein said loading mechanism comprises means for moving said support (25), and thereby said information carrier (26), in both a first direction and a second direction, substantially orthogonal to said first direction, which means comprises at least a first linkage mechanism including at least two linked members which are pivotally connected to each other at adjacent ends of said link members, one of said link members being pivotally connected to said support (25), and wherein said first linkage mechanism comprises at least four link members, including:

a first member (1) which is rigidly connected to a frame (24) of the apparatus (23),

a second member (2) constructed as a crank which is connectable to drive means and which has one end pivotally connected to one end of the first member (1),

a third member (3) which has one end pivotally connected to the other end of the second member (2), either directly or via an intermediate member, and which has its other end pivotally connected to said support (25),

a fourth member (4) which has one end pivotally connected to the third member (3) and which has its other end pivotally connected to the other end of the first member (1), the lengths of said four members and the location of the pivot between the third member (3) and the fourth member (4) being such that pivoting of said second member (2) by said drive means can produce movement of the support (25), and therefore of the information carrier (26), in said first and second directions.

5,063,464

LOW PROFILE SUSPENSION

Hans Astheimer, Winterbach; Helma Brumme; Werner Heck, both of Mainz; Klaus Kissel, Russelsheim, and Hubert Schuy, Mainz, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 8, 1990, Ser. No. 520,566

Int. Cl.[5] G11B *5/60, 21/21*

U.S. Cl. 360—104 **17 Claims**

1. A magnetic head suspension in a magnetic disk storage device, wherein at least one magnetic head suspension is associated with a magnetic disk recording surface, comprising

a slider which, upon adequate rotation of the confronting magnetic disk, is maintained above the magnetic disk surface by an air cushion;

a magnetic head fixed to said slider;

a flexure fixed to said slider;

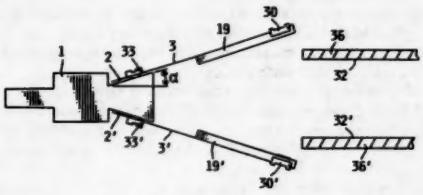
a suspension arm fixed to said flexure having a longitudinal

axis and engaging said flexure to exert a load force on said slider through said flexure; and

an arm portion connected to and supporting said suspension arm;

the free end of said suspension arm on the side averted from the magnetic disk surface being provided with a relatively stiff raised portion which forms a recess and extends in the direction of the longitudinal axis of said suspension arm,

a tongue portion of said flexure disposed within said recess



adjacent the raised portion upper upper region and movable parallel thereto,

said slider being fixed to said tongue surface facing the opening of said recess, said tongue being parallel to and above the surface of the portion thereof attached to said suspension arm at a spacing which is less than the depth of said recess, and

said flexure being connected to said suspension arm such that the means used to fix said slider to said flexure is positioned in the recess portion of said suspension arm.

5,063,465

HEAD SUPPORTING MECHANISM OF A RECORDING/REPRODUCING APPARATUS

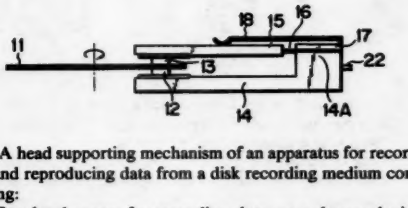
Masahiko Fujioka, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 24,555, Mar. 11, 1987, abandoned. This application Nov. 27, 1989, Ser. No. 442,397

Claims priority, application Japan, Mar. 25, 1986, 61-66281

Int. Cl.[5] G11B *5/48, 21/16*

U.S. Cl. 360—104 **5 Claims**



1. A head supporting mechanism of an apparatus for recording and reproducing data from a disk recording medium comprising:

a first head means for recording data on and reproducing data from one surface of the disk recording medium;

first supporting means for supporting the first head means at one end thereof;

a second head means for recording data on and reproducing data from the other surface of the disk recording medium;

second supporting means for supporting the second head means at one end thereof, said second supporting means including a head supporting portion for supporting said second head means and a leaf spring means for flexibly supporting said head supporting portion; and

at least one member formed of a weldable material and embedded in said first supporting means at the other end thereof, said embedded member being partly exposed for fixedly receiving said leaf spring means, said leaf spring means being welded to the embedded member for connecting said first and second supporting members.

5,063,466

ROTARY HEAD TYPE MAGNETIC RECORDING AND REPRODUCING APPARATUS

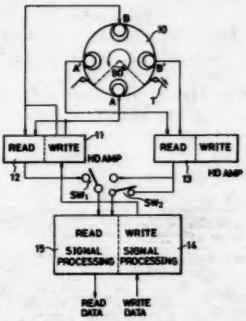
Tatsumaro Yamashita, Shibata, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 441,684

Claims priority, application Japan, Dec. 5, 1988, 63-308460

Int. Cl.[5] G11B *5/52*

U.S. Cl. 360—107 **12 Claims**



1. A rotary head type magnetic recording and reproducing apparatus for use with a magnetic tape having index information comprising:

a rotary drum adapted for contacting the magnetic tape;

a pair of magnetic heads for recording and reproduction mounted on said rotary drum;

a pair of magnetic heads for reproduction alone mounted on said rotary drum;

head amplifiers connected to said heads for reading the index information by both said magnetic heads for recording and reproduction and said magnetic heads for reproduction alone in a high speed search mode; and

a reproduced signal processing circuit connected to said head amplifiers.

5,063,467

MAGNETIC HEAD WITH SATURABLE GAP AND MATRIX DEVICE COMPRISING A MULTIPLICITY OF SUCH HEADS

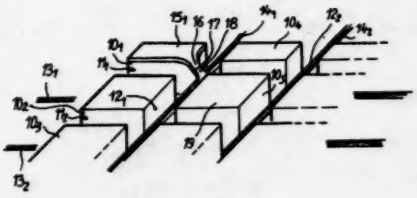
Joseph Colineau, Bures sur Yvette, France, and Jurgen Machui, Munich, Fed. Rep. of Germany, assignors to Thomson-CSF, Puteaux, France

Filed Oct. 27, 1989, Ser. No. 427,369

Claims priority, application France, Nov. 15, 1988, 88 14806

Int. Cl.[5] G11B *5/235, 5/197*

U.S. Cl. 360—119 **11 Claims**



1. A matrix magnetic head device comprising:

a plurality of magnetic heads;

conductors associated with each of said plurality of magnetic heads and extending in rows and columns for producing a magnetic field within the magnetic heads when an excitation current flows through the conductors;

wherein each of the magnetic heads comprises two magnetic

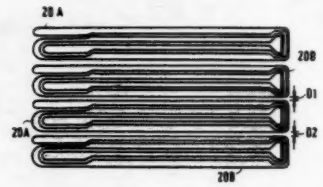
poles separated by a gap comprising a magnetic material having a saturation value less than a saturation value of the poles, the gap being saturated only at a predetermined threshold first intensity of excitation current and the poles being saturated at a predetermined threshold second intensity of excitation current which is substantially equal to three times that of the first intensity, such that when the gap is not saturated, the magnetic field remains confined within the gap.

5,063,468

COMPATIBLE MAGNETIC HEAD ASSEMBLY

Donald T. Best, Lafayette Hill, Pa., assignor to North American Philips Corporation, New York, N.Y.

Filed May 8, 1990, Ser. No. 520,791
Int. Cl.[5] G11B *5/17, 5/265*
U.S. Cl. 360—123 **20 Claims**



1. A magnetic head assembly for reading from and writing to a plurality of tracks on a magnetic medium, said medium and assembly being relatively moveable in a longitudinal direction, comprising:

a plurality of pairs of reading poles;

a plurality of pairs of read loops each adjacent and magnetically coupled to an associated pair of said reading poles;

a plurality of writing poles, each pair of said reading poles being aligned with a different corresponding one of said writing poles; and

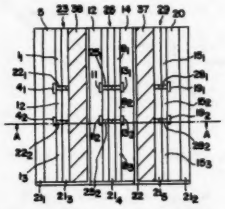
a plurality of pairs of write loops each pair of write loops being adjacent and magnetically coupled to an affiliated one of said writing poles, each pair of write loops being selectively driveable with a pair of currents in either the same or opposite sense.

5,063,469

COMPOSITE MAGNETIC HEAD ASSEMBLY HAVING REDUCED CROSS FEED BETWEEN WAITING AND READING HEADS

Takahiko Tandai, Aomori, Japan, assignor to Nakamichi Corporation, Tokyo and Nakamichi Fukushima Corporation, Fukushima, both of, Japan

Filed Nov. 17, 1989, Ser. No. 438,704
Claims priority, application Japan, Nov. 18, 1988, 63-291716
Int. Cl.[5] G11B *5/127, 5/115*
U.S. Cl. 360—128 **7 Claims**



1. A composite magnetic head comprising:

a writing head assembly including a first ring head composed of a first half provided with a coil and a second half secured to said first half;

first and second shielding members of magnetic material arranged on opposite sides of said writing head assembly;

a first reading head assembly arranged on the side of said first shielding member and including a second ring head composed of third and fourth halves secured to each other, each provided with a coil;

third and fourth shielding members of magnetic material arranged on opposite sides of said first reading head assembly, said first and fourth shielding members being arranged in opposition to each other with a predetermined gap therebetween;

a second reading head assembly arranged on the side of said second shielding member and including a third ring head composed of fifth and sixth halves secured to each other, each provided with a coil;

fifth and sixth shielding members of magnetic material arranged on opposite sides of said second reading head assembly, said second and sixth shielding members being arranged in opposition to each other with a predetermined gap therebetween; and

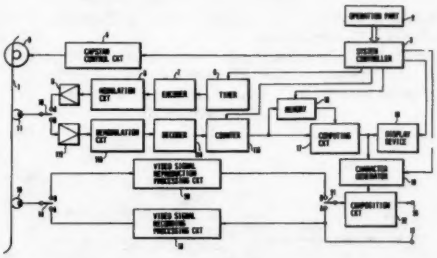
a thin plate of magnetic material attached to front faces of said fourth shielding member and said fourth half of said first reading head assembly.

5,063,470

INFORMATION SIGNAL REPRODUCING APPARATUS CAPABLE OF GRASPING REPRODUCING POSITION ON A TAPE-SHAPED RECORDING MEDIUM

Keiichi Fukuzawa, and Yoshiki Ishii, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1989, Ser. No. 377,537
Claims priority, application Japan, Jul. 18, 1988, 63-177185
Int. Cl.[5] G11B *15/00, 27/2*
U.S. Cl. 360—137 **10 Claims**



8. An information signal reproducing apparatus, comprising:

a) reproducing means for reproducing an information signal from a tape-shaped recording medium;

b) time information reproducing means for reproducing time information recorded on said tape-shaped recording medium;

c) first extracting means for designating a first position of said tape-shaped recording medium and for extracting time information according to said first position;

d) detecting means for detecting inconsecutive points of said time information reproduced by said time information reproducing means;

e) second extracting means for extracting, in response to detection by said detecting means of each of said inconsecutive points, parts of said time information reproduced immediately before and immediately after each of said inconsecutive points;

f) first computing means for computing first information indicative of a difference between the part of said time information reproduced immediately before an inconsecutive point and said time information according to said first position;

g) second computing means for computing second information indicative of a difference between the part of said

time information reproduced immediately after said inconsecutive point and a part of time information currently reproduced; and

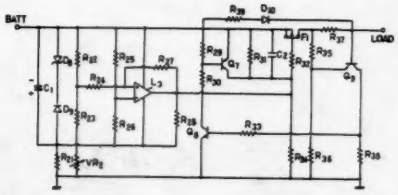
h) third computing means for obtaining third information by adding together said first information and said second information.

5,063,471

BATTERY PROTECTION CIRCUIT

Tae-Hong Park, Inchun, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 18, 1989, Ser. No. 395,492
Int. Cl.[5] H02H 7/10
U.S. Cl. 361—18 3 Claims



1. A battery protection circuit, comprising:

means for receiving an output voltage of a battery;

a comparator;

a field-effect transistor;

a first resistor coupled to a gate of said field-effect transistor;

a first plurality of resistors and a variable resistor to a positive input port of said comparator;

a feedback resistor;

means coupled between said receiving means and said negative input port, for applying a first reference potential to said negative input port;

a first transistor;

a first resistor;

the comparator having an output port connected to a gate of said field-effect-transistor through said first resistor so as to provide a particular hysteresis characteristic;

a third plurality of resistors connected with a collector of said first transistor;

a load terminal;

a second transistor;

a fourth plurality of resistors connected between said load terminal and a drain of said first transistor, said first transistor being turned on or off depending on a voltage across said fourth plurality of resistors, and said third plurality of resistors being connected with a base of said second transistor;

a third transistor;

a base of said third transistor being connected through a second resistor to a collector of the second transistor and the emitter of the second transistor being connectable to a second reference potential;

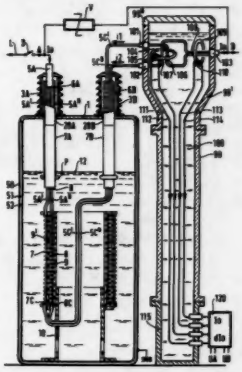
whereby when the third transistor is turned on, a voltage between the gate and a source of the field-effect transistor is changed to equal the voltage between the collector and the emitter of the third transistor plus a voltage across said first resistor, so that the battery is protected from excess currents.

5,063,472

DEVICE FOR DETECTING SUPERCONDUCTOR QUENCHING AND APPLICATION TO A SUPERCONDUCTING CURRENT LIMITER

Pham van Doan, Meyzieu; Jean-Pierre Dupraz, Lyons, and Alain Février, Maurepas, all of France, assignors to GEC Alsthom SA, Paris, France

Filed Apr. 2, 1990, Ser. No. 502,730
Claims priority, application France, Apr. 4, 1989, 89 04410
Int. Cl.[5] H02H 9/02
U.S. Cl. 361—19 18 Claims



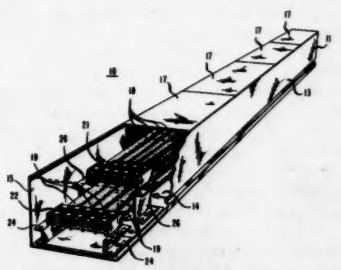
1. A device for detecting quenching of a portion of a superconductor element comprising: two identical superconducting conductors coupled to non-superconducting conductors in each of which a current flows, and electrically connected in parallel, and means for detecting a threshold value of one of a difference of intensity and a phase-difference between said currents flowing in said device indicative of quenching of a portion of said superconductor element.

5,063,473

MODULAR ELECTRICAL SERVICE DISTRIBUTION SYSTEM

James R. Hall, Dracut, Mass.; Lorin E. Hunter, and Terry D. Wilson, both of Roswell, Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 6, 1989, Ser. No. 431,792
Int. Cl.[5] H02G 3/28
U.S. Cl. 361—93 6 Claims



1. An electrical service module for interconnection with other similar service modules to provide a continuous electrical service line, said service module comprising:

a section of duct having a first predetermined length;

duct section attaching means for attaching said duct section to a duct section of an adjacent similar module;

feeder wire connecting means rigidly fastened to and positioned within said section of duct, said connecting means including a first plurality of mutually insulated individual wire connectors arranged in a first tier and at least a second plurality of mutually insulated individual wire connectors arranged in a second tier positioned above and horizontally displaced relative to said first tier of wire connectors; and

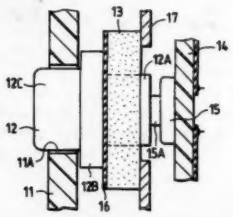
a plurality of insulated electrical feeder wires each having a second predetermined length, each of said feeder wires having one end connected to one of said individual wire connectors and the other end bared of insulation, said second predetermined length being such that said bared ends of said feeder wires protrude from said duct section so that each of said feeder wires is readily connectable to a corresponding wire connector in an adjacent similar module.

5,063,474

APPARATUS FOR, AND METHOD OF, DISCHARGING STATIC ELECTRICITY IN A DISPLAY AND PUSH-BUTTON SWITCH

Ken Igarashi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 360,632
Claims priority, application Japan, Jun. 29, 1988, 63-87403[U]
Int. Cl.[5] H05F *3/02*
U.S. Cl. 361—220 **7 Claims**



1. A static electricity discharging device used in a switch for an electrical equipment comprising:

(a) a push button having a body portion penetrating into said electrical equipment and being movable into and out of an operative position so as to operate the switch of the electrical equipment;

(b) an elastic member in mating relationship with said body portion such that said elastic member is maintained in position with respect to said push button, said elastic member normally maintaining said push button out of said operative position, said elastic member being elastically deformable by said push button when said push button is moved to said operative position; and

(c) an electrically-conductive layer disposed on a surface of said elastic member and also in mating relation with said body portion, said electrically-conductive layer being electrically grounded whereby external static electricity applied to said push button is passed directly to the ground through said electrically-conductive layer wherein said body portion of said push button includes an elongated body which has a flange formed therearound intermediate opposite ends thereof, a front portion extending forwardly form said flange, and a rear portion extending rearwardly from said flange, said elastic member having an annular shape, said electrically-conductive layer being of an annular shape and being affixed to one side of said elastic member, said rear portion of said push button body extending through said electrically-conductive layer and said elastic member with said electrically-conductive member held in contact with one side of said flange facing away from said front portion of said push button body, and the other side of said elastic member adapted to be mated with a support wall of the electrical equipment.

3. A static electricity discharging device for use in an electrical display device with electrical elements comprising:

a panel;

a transparent plate put in said panel, an area portion of said transparent plate being used as a window for viewing said electrical element;

an elastic member interposed between said panel and said electrical elements in said display device to maintain contact with both said panel and said electrical elements, said elastic member being provided at locations proximate a periphery defined by said area portion; and,

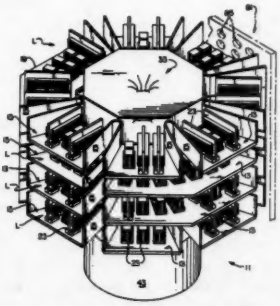
an electrically-conductive layer disposed on a surface of said elastic member between said elastic member and said electrical elements, said electrically-conductive layer being electrically grounded whereby external static electricity applied to said transparent plate is passed to the ground through said electrically-conductive layer.

5,063,475

MULTILEVELED ELECTRONIC ASSEMBLY WITH COOLING MEANS

Albert L. Balan, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1990, Ser. No. 495,863
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—384 **19 Claims**



1. In an multileveled electronic assembly including a plurality of spacedly positioned substrates located at different levels within said assembly and each including thereon a plurality of heat generating electronic components, said assembly including means to provide cooling of said electronic components, the improvement wherein said cooling means comprises a plurality of individual duct members centrally oriented within said assembly, each of said duct members directing cooling fluid onto said electronic components on a respective one of said substrates to cool said electronic components.

5,063,476

APPARATUS FOR CONTROLLED AIR-IMPINGEMENT MODULE COOLING

Talal T. Hamadah, Littleton, Mass.; Douglas N. Ryder, Amherst, N.H., and Harvey S. Friedman, Sudbury, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

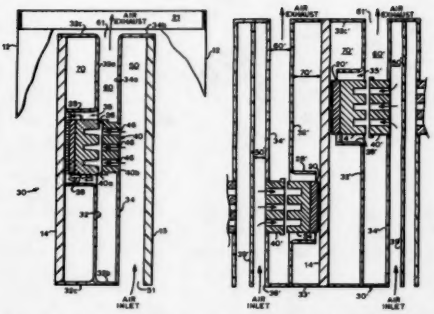
Filed Dec. 5, 1989, Ser. No. 446,258
Int. Cl.[5] H02B *1/00*
U.S. Cl. 361—384 **35 Claims**

1. Cooling apparatus for removing the heat from heat dissipating electronic components mounted to a first circuit board configured for insertion into a backplane, said apparatus comprising:

wall means for substantially thermally isolating each of said electronic components one from the other;

inlet means for directing cooling air to said electronic com-

ponents, said inlet means having nozzle means configured, dimensioned and arranged for alignment with each of said electronic components;



exhaust means for isolating and removing heated air from said electronic components, said exhaust means arranged between said inlet means and said first circuit board; and

air-moving means for drawing cooling air into said inlet means and removing heated air from said exhaust means.

5,063,477

FRAME FOR CIRCUIT BOARDS WITH ELECTRONIC COMPONENTS

Wolfgang Paggen, Starnberg, and Josef Neblich, Wartenberg, both of Fed. Rep. of Germany, assignors to Knurr-Mechanik fur die Elektronik Aktiengesellschaft, Munich, Fed. Rep. of Germany

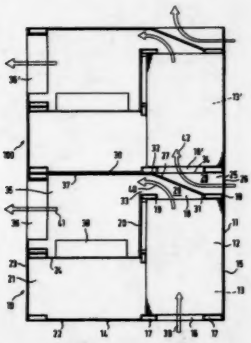
Filed Nov. 7, 1989, Ser. No. 432,507

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1988, 3837744

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—384 **5 Claims**

1. A ventilated storage assembly for electric circuit boards comprising at least two stacked like frames (10, 100) including a lower frame (10) and an upper frame (100), each frame comprising a base (14), a top (30), a front (15), a back (23) and sides, the base of the upper frame (100) being supported on the top (30) of the lower frame, each frame including a front reception area (13, 13') at the front of the respective frame for vertically disposed circuit boards, each front reception area extending upwardly from the base of the respective frame, a first air inlet (16, 16') in the base of each frame communicating with the respective front reception area (13, 13'), an air opening (18) at the top of each front reception area aligned with the respective first air inlet, an air space (25) between the top of each front reception area and the top of the respective frame, a baffle (27) in each air space dividing the space into front (28) and rear (29) air passages, a second air inlet (26) in the front of each frame communicating with the respective front air passage (28), a first air outlet (34) from said front air passage (28) formed in the top of each frame in alignment with the respective first air inlet (16, 16'), a rear reception area (35) in each frame behind the respective front reception area and communicating with the respective rear air passage (29), each rear reception area extending from the top of the respective frame to a level below the top of the respective front reception area, a second air outlet in the back of each frame communicating with the re-



spective rear reception area, and a fan (36, 36') associated with each second outlet for causing air to flow through the respective frame, the fan (36) of the lower frame being effective for causing air to flow through the first air inlet (16) of the lower frame, the front reception area (13) of the lower frame, the rear air passage (29) of the lower frame, the rear reception area (35) of the lower frame and the second air outlet of the lower frame, and the fan (36') of the upper frame being effective for causing air to flow through the second air inlet (26) of the lower frame, the front air passage (28) of the lower frame and the first air outlet (34) of the lower frame and hence through the first air inlet (16') of the upper frame, the front reception area (13') of the upper frame, the rear air passage of the upper frame, the rear reception area of the upper frame and the second air outlet of the upper frame.

5,063,478

ELECTRICAL OR ELECTRONIC CONTROL KEY PAD

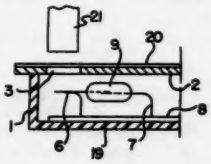
Bernard Danglot, 12 allee des Bruyeres, 95250 Beauchamp, France

PCT No. PCT/FR88/00280, § 371 Date Apr. 3, 1990, § 102(e) Date Apr. 3, 1990, PCT Pub. No. WO89/12310, PCT Pub. Date Dec. 14, 1989

PCT Filed Jun. 3, 1988, Ser. No. 460,964

Int. Cl.[5] H05K *1/18, 5/06*

U.S. Cl. 361—405 **9 Claims**



1. An electrical or electronic control key pad comprising:

a case;

a front panel mounted on the case, the front panel having a plurality of apertures passing therethrough, the front panel having a non-apertured portion for blocking magnetic flux from a magnet and having the plurality of apertures for allowing the magnetic flux from the magnet to pass therethrough;

a printed circuit on a base portion of the case; and

a plurality of detector means connected to the printed circuit for detecting the magnetic flux passing through the apertures, the detector means each having a main body including blades which are sensitive to a magnetic field, each blade being extended by a pin, one portion of at least one of said pins being located under one of the plurality of apertures, while said main body and another portion of said pins located under the non-apertured portion of the front panel.

5,063,479

ILLUMINATING SWITCH APPARATUS

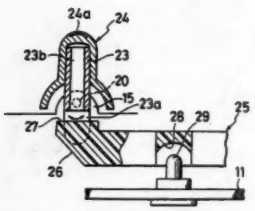
Yukihiko Satoh, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 580,404

Claims priority, application Japan, Dec. 11, 1989, 1-142033

Int. Cl.[5] F21V *8/00*

U.S. Cl. 362—32 **4 Claims**



1. An illuminating switch apparatus comprising:

a case **10**;

a light source **29** disposed on said case **10**;

a plurality of switches **12**, **13** disposed on said case **10** and spaced from said light source **29**, each of said plurality of switches **12**, **13** comprising a bearing portion **15** and switch operating members **23**, **31** pivotally disposed on said bearing portions **15** about an axis, said switch operating members **23**, **31** defining light conducting paths **23***b*; and

a light conducting body **25** disposed on said case **10** comprising a plurality of arms extending from a point adjacent said light source **29** to said switch operating members **23**, **31**, said arms having an upper surface projecting portion **27** and at least one reflecting surface **25***a*, **26** such that light from said light source **29** is reflected by said at least one reflecting surface **25***a*, **26** and through said upper surface projecting portion **27** such that said light is directed through said light conduction paths **23***b*.

5,063,480

VEHICLE HEADLAMP ADJUSTMENT DEVICE

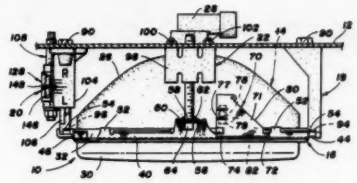
David R. McMahan; William E. Magengast, and Luis A. Mateos, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

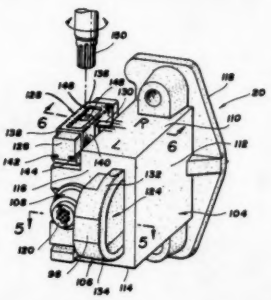
Filed Aug. 13, 1990, Ser. No. 566,905

Int. Cl.[5] B60Q *1/02*

U.S. Cl. 362—61 **3 Claims**

1. In combination with a headlamp assembly having a lamp unit supporting a light source and adapted to be adjusted in a vertical plane and in a horizontal plane relative to a support panel for aiming the light beam emitted by said lamp unit, a first adjustment device located between said support panel and a first portion of said lamp unit for adjusting the position of said lamp unit in said vertical plane, a second adjustment device located between said support panel and a second portion of said lamp unit for adjusting said lamp unit in a horizontal plane, said second adjustment device comprising a housing fixed to said support panel and supporting a relatively movable pivot member which provides a pivot point for one end of said headlamp unit, a screw rotatably supported by said housing and threadably connected to said pivot member for moving the latter fore and aft of said housing for adjusting the position of said one end of said lamp unit for aiming purposes, indicia formed on said housing for indicating the adjusted aim position of said lamp unit in said horizontal plane, and a position indicator adjustably carried by said pivot member adjacent to said indicia so that upon establishing the desired aimed position of said lamp unit by rotating said screw, said position indicator is subsequently moved relative to said pivot member in line with a zero ("0") marking of said indicia so as to indicate the adjusted position of said lamp unit in said horizontal plane, said position indicator comprising a slide member provided with a pointer, said slide member having a top section with an elongated slot formed therein, one side wall of said slot having a plurality of teeth adopted to be engaged by a hand tool for moving said slide member relative to said indicia.





5,063,481

PIVOT ASSEMBLY FOR VEHICLE HEADLIGHT POSITION ADJUSTMENT

John P. Martin, Timberlake, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 15, 1990, Ser. No. 597,655

Int. Cl.[5] B60Q *1/02*

U.S. Cl. 362—61 **4 Claims**

1. A releasable pivot assembly for providing a stationary pivot point for positioning a vehicle headlight mounted upon a movable frame relative to a fixed frame, said assembly comprising a one piece ball stud and a retainer clip, said ball stud including;

a flange;

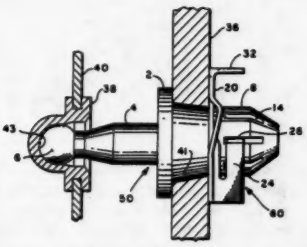
a first elongate portion extending substantially transversely from one side of the flange to a free-end thereof having a ball-like configuration adapted for pivotal engagement with a selective one of the fixed and movable frames;

a second substantially cylindrical portion extending substantially transversely from the opposite side of the flange in substantial axial alignment with the first portion to a free-end thereof, said second portion having an annular groove

disposed in the outer surface thereabout in predetermined spaced-apart relationship to the flange;

said outer surface between the annular groove and the free-end having a plurality of circumferentially spaced grooves disposed therein in substantial transverse relationship to the annular groove;

said retainer clip having a base portion having an open-ended slot at one end surrounded by an edge of the base member adapted to be received into the annular groove, and at least one resilient arm extending from the base member and configured such that a free-end thereof is receivable into one of the ball stud circumferentially spaced grooves when the retainer clip slot edge is received into the annular groove;



said assembly operative such that, when the ball stud second portion is inserted through an opening in the selected one of the fixed and movable frames with the flange abutting against one side thereof, the ball stud first portion extends away therefrom towards the other of said fixed and movable frames for pivotal engagement therewith and the ball stud second portion annular groove is positioned adjacent the opposite side of the selected frame and operable to receive the retainer clip slot edge thereinto to secure the ball stud against axial movement relative to the frame opening and the resilient arm free-end is engagable with one of the ball stud second portion circumferentially spaced grooves to secure the ball stud against rotation relative to the frame opening.

5,063,482

MOTOR VEHICLE HEADLIGHT INCLUDING AN INDICATOR DEVICE FOR INDICATING THE ELEVATION DIRECTION OF ITS REFLECTOR

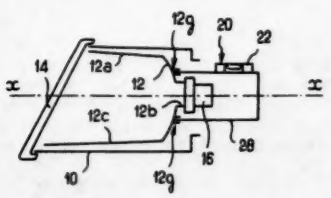
Patrice Collot, Pantin; Jean-Marie Brel, Claye-Souilly, and Guy Dehaene, Bagnolet, all of France, assignors to Valeo Vision, Bobigny Cedex, France

Filed Feb. 19, 1991, Ser. No. 657,510

Claims priority, application France, Feb. 20, 1990, 90 02027; Jun. 25, 1990, 90 07939

Int. Cl.[5] F21M *3/20*

U.S. Cl. 362—66 **10 Claims**



1. A motor vehicle headlight comprising a light source, a reflector having a lamp supporting collar and a rear face, a housing, and a front glass, and also comprising an indicator device for indicating the elevation direction of the reflector, the indicator device being of the type comprising a spirit level mounted on said reflector in a plane which is essentially vertical and parallel to the optical axis defined by said reflector, the spirit level being in a predetermined angular relationship with said optical axis, wherein the spirit level is mounted on a hollow support having an end edge which is mounted adjacent an indicator support collar means which abuts against the rear face of the reflector around a lamp mounted in the reflector and at a distance from said lamp supporting collar.

5,063,483

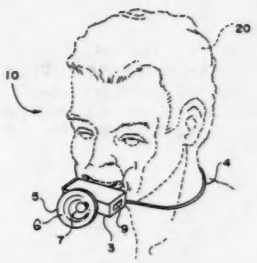
BATTERY POWERED LIGHT WITH MOUTHPIECE

John Feilmeier, and Rosemary Feilmeier, both of 3136 S. Lakeport Rd., Sioux City, Iowa 51106

Filed Oct. 26, 1990, Ser. No. 603,389

Int. Cl.[5] F21L *15/08*

U.S. Cl. 362—103 **6 Claims**



1. A light comprising:

a) a housing containing a power source and illumination means selectively electrically connectable to said power source;

b) a mouthpiece connected to said housing and including a curved channel generally conforming to a user's bite and adapted to receive said user's teeth therein; and

c) cord attachment means interposed between said mouthpiece and housing for attaching a cord thereto.

5,063,484

REMOTE CONTROL UNIT

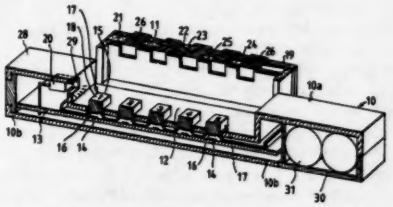
Kouji Tanaka, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1991, Ser. No. 684,617

Claims priority, application Japan, Jul. 26, 1990, 2-78721[U]

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—109 **4 Claims**



1. A remote control unit, comprising a body case having a recess defined by an upper wall thereof and having a rising portion provided by provision of said recess, a plurality of push-button switches provided for individual manual operation on said upper wall thereof at said recess, a door mounted for pivotal motion on said body case between a closed position in which said door is fitted in said recess and covers over said push-button switches and an open position in which said push-button switches are capable of being manually operated, a plurality of push-buttons disposed for individual manual operation on said door in such a manner as to oppose, when said door is in the closed position, to said push-button switches so

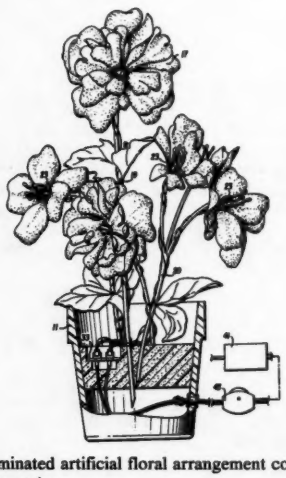
that each of said push-button switches may be operated by operation of a corresponding one of said push-buttons, said rising portion of said body case having a light admitting hole perforated in a side wall thereof adjacent said recess, a light emitting element accommodated in said rising portion of said body case such that light emitted therefrom may be admitted into said recess through said light admitting hole so that, when said door is in the open position, such light may be projected to display portions of said push-button switches, and a light conducting member provided on a rear face of said door for introducing, when said door is in the closed position, light emitted from said light emitting element and admitted by way of said light admitting hole into said recess to display portions of said push-buttons on said door.

5,063,485

ILLUMINATED ARTIFICIAL FLOWERS

Edward H. Harris, 216 Hillcrest, Henderson, Nev. 89015

Filed Dec. 18, 1989, Ser. No. 451,980
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—122 **1 Claim**



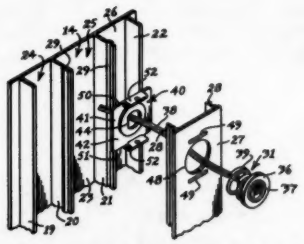
1. An illuminated artificial floral arrangement comprising
a hollow container;
a platform of penetrable material secured within said container between the top and bottom thereof;
an electrical terminal block mounted within said platform and accessible from the upper side thereof;
a plurality of artificial flowers having petals and a stem, each of said stems having a pointed tip so that they can be selectively removably inserted through said platform whereby said flowers are supported by said platform;
a plurality of low voltage lamps secured within said artificial flowers;
electrical leads wound about said stems and interconnecting said low voltage lamps to said electrical terminal block;
a low voltage transformer;
electrical leads connected to and extending from said terminal block through said container and connected to said low-voltage transformer;
means for connecting said low voltage transformer to a standard electrical outlet; and
insulated decorative cover material extending above said platform and said terminal block for concealing the platform and block.

5,063,486

MOUNTING APPARATUS FOR A FLUORESCENT LAMP HOLDER

Thomas L. Cummings, III, Nashville, and Ned S. Al-Orfali, Murfreesboro, both of Tenn., assignors to Cummings Incorporated, The International Sign Service, Nashville, Tenn.

Filed Oct. 29, 1990, Ser. No. 604,100
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—217 **11 Claims**



1. A mounting apparatus for a fluorescent lamp holder having a body portion of non-circular cross-section and an enlarged head adapted to detachably receive one end of a fluorescent lamp, an electrical wire connected to said body portion, and a pair of spring clips on opposite sides of said body portion, comprising:
(a) a mounting plate having a front surface and a rear surface and a central hole therethrough larger than the largest cross-section of said lamp holder to permit the passage of said lamp holder through said central hole,
(b) a pair of elongated slots extending through said mounting plate adjacent opposite sides of said central hole,
(c) an attachment bracket comprising a plate member having front and rear surfaces and an attachment hole therethrough, said attachment hole having a non-circular shape of a size permitting insertion of the body portion of the lamp holder through said attachment hole from front-to-rear, the spring clips on said body portion being compressed by said attachment hole as said body portion is inserted through said attachment hole, said spring clips snapping outward behind and engaging said plate member when said body portion is fully inserted in said attachment bracket in a mounting position,
(d) a pair of latch tongues projecting forward from said plate member spaced apart on opposite sides of said attachment hole, said latch tongues having the same spacing as said elongated slots and adapted to be received in said elongated slots as said attachment bracket is moved forward toward said mounting plate, each of said latch tongues having a retainer member engaging said rear surface of said mounting plate after said latch tongues are fully received in said slots in said mounting position, and
(e) the head of said lamp holder projecting forward through said central hole in said mounting position.

5,063,487

MAIN AND AUXILIARY TRANSFORMER RECTIFIER SYSTEM FOR MINIMIZING LINE HARMONICS

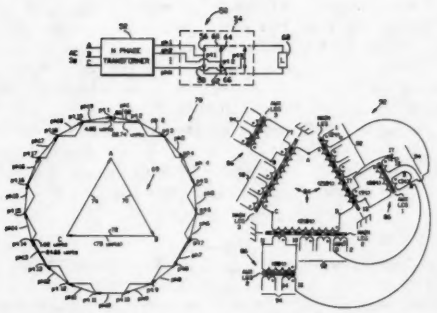
Leopold J. Johnson, Valley Center, and Russell E. Hammond, La Jolla, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 22, 1990, Ser. No. 497,387
Int. Cl.[5] H02M *1/14, 5/14, 7/06*
U.S. Cl. 363—3 **10 Claims**

1. A transformer system comprising:
a main transformer having at least one leg with said leg having a primary main winding and a plurality of secondary main winding therearound, one turn of said secondary main windings inducing one step of voltage change to a

waveform passed through said at least one of said legs of said main transformer; and

an auxiliary transformer having at least one leg with a primary auxiliary winding therearound, said primary auxiliary winding being operatively coupled in series with one of said secondary main windings with said at least one leg



of said auxiliary transformer also having a plurality of secondary auxiliary windings therearound, one turn of said secondary auxiliary windings inducing a fraction of said one step of voltage change to a waveform passed through said at least one of said legs of said auxiliary transformer.

5,063,488

SWITCHING POWER SOURCE MEANS

Kosuke Harada, Fukuoka, and Hiroshi Sakamoto, Ohnojyo, both of Japan, assignors to Kyushu University, Fukuoka, Japan

Continuation-in-part of Ser. No. 323,381, Mar. 14, 1989. This application May 30, 1990, Ser. No. 530,814

Claims priority, application Japan, Sep. 16, 1988, 63-230133; Sep. 12, 1989, 1-234577

Int. Cl.[5] H02M *3/337*

U.S. Cl. 363—16 **14 Claims**

1. A switching power source, comprising:

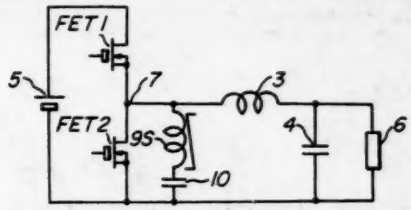
a DC voltage source;

a first switch element connected to said DC voltage source;

low-pass filter means having an output end for connection to a load and an input end selectively connectable to said DC voltage source through said first switch element;

a second switch element connected in parallel relative to the input end of said low-pass filter means, said first and second switch elements each comprising a MOS-FET having parasitic capacitors and being turned on and off so that an output signal of desired frequency is produced at the output end of said low-pass filer means;

a reactor connected in parallel with said second switch element for charging and discharging said parasitic capacitors during a switching operation hen said first switch element is switched off and said seconds witch element is switched on, and vice versa, said reactor including a



saturable core for giving a non-linear property to said reactor; and

a capacitor connected in series with said reactor so that the series connection of said reactor and said capacitor is in parallel with said second switch element, wherein said first and second switch elements are directly connected together at a common connection point, and the series connection of said reactor and said capacitor is connected directly to said common connection point.

5,063,489

SWITCHING REGULATOR HAVING IMPROVED SWITCHING CONTROL ARRANGEMENT

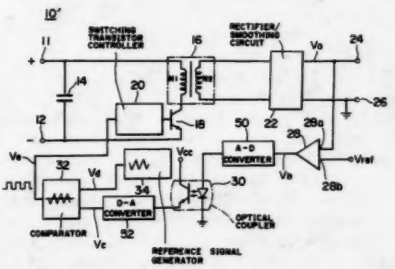
Katsuhiko Inaba, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 6, 1990, Ser. No. 505,391

Claims priority, application Japan, Apr. 6, 1989, 1-85707

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—21 **3 Claims**



1. A switching regulator, comprising:

a transformer, said transformer having a primary winding and a secondary winding, said primary winding being coupled to receive an unregulated dc voltage;

an electrical switching means, said electrical switching means being coupled to said primary winding for intermittently operating said transformer;

a first controller, said first controller being coupled to control said electrical switching means by varying a duty cycle thereof;

a rectifier, coupled to said secondary winding, for producing a dc output to be derived as an output of said switching regulator;

an error amplifier, coupled to receive the dc output of said rectifier and a first reference signal, for generating an

error signal indicating an amplitude difference therebetween;

an A-D converter, coupled to receive said error signal, for generating a digital error signal corresponding to said error signal;

an optical coupler, said optical coupler being coupled to receive said digital error signal;

a D-A converter, coupled to receive the output of said optical coupler, for generating an analog error signal corresponding to the digital error signal; and

a second controller, said second controller being coupled to control said electrical switching means via said first controller in accordance with said analog error signal.

5,063,490

REGULATED CHOPPER AND INVERTER WITH SHARED SWITCHES

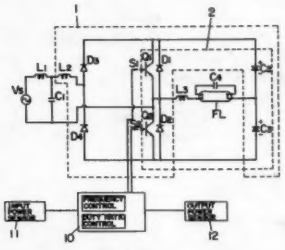
Minoru Maehara, Kadoma, and Haruo Nagase, Nara, both of Japan, assignors to Matsushita Electric Works Ltd., Kadoma, Japan

Filed Apr. 24, 1990, Ser. No. 514,052

Claims priority, application Japan, Apr. 25, 1989, 1-105181; May 26, 1989, 1-134397; Jul. 26, 1989, 1-193431; Jul. 26, 1989, 1-193435

Int. Cl.[5] H02M *5/458*

U.S. Cl. 363—37 11 Claims



1. A power supply, comprising:

a source of AC voltage;

a chopper circuit, including

(a) a pair of first and second switching elements operatively connected to said AC voltage source, and

(b) capacitor means, operatively connected to the first and second switching elements, for smoothening a periodically interrupted voltage from said AC voltage source through the first and second switching elements so as to provide a resulting smoothened DC voltage thereat;

an inverter circuit means, including the first and second switching elements in common with said chopper circuit, for driving the first and second switching elements to turn on and off so as to provide from the DC voltage of the capacitor means an AC voltage to a load connected to said inverter circuit means at first and second load connection points; and

power control means, operatively connected to inputs of the first and second switching elements, for varying at least one of a switching frequency and a duty ratio for the first and second switching elements so as to provide the periodically interrupted voltage from said AC voltage source by turning on and off the first and second switching elements in accordance with a chopper input power and an inverter output power, said power control means equalizing the chopper input and inverter output powers.

5,063,491

SWITCHING REGULAR UNDERVOLTAGE DETECTOR

Nakamura Shigeo, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

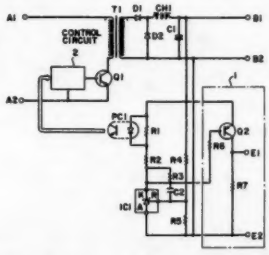
PCT No. PCT/JP89/00525, § 371 Date Jan. 12, 1990, § 102(e) Date Jan. 12, 1990, PCT Pub. No. WO89/12348, PCT Pub. Date Dec. 14, 1989

PCT Filed May 25, 1989, Ser. No. 459,812

Claims priority, application Japan, Jun. 9, 1988, 63-142452

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—56 6 Claims



1. A switching regulator output change detector for a switching regulator including an error detection circuit, arranged such that a current or voltage is increased and output when an output voltage at an output of the switching regulator rises above a predetermined value, and that a current or voltage is not output when the output voltage falls below the predetermined value, and a feedback circuit at the output of the switching regulator, for controlling a control circuit of a switching transistor in response to an output signal from an output of said error detection circuit, said switching regulator output change detector comprising:

a detector including only one transistor coupled by a collector and an emitter to the output of the switching regulator, said detector being operated by using the output of said error detection circuit as a control input.

5,063,492

MOTION CONTROL APPARATUS WITH FUNCTION TO SELF-FORM A SERIES OF MOTIONS

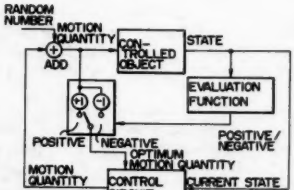
Haruo Yoda, Tokyo; Takafumi Miyatake, Hachioji, and Hitoshi Matsushima, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 15, 1989, Ser. No. 436,725

Claims priority, application Japan, Nov. 18, 1988, 63-289989

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—167.01 16 Claims



1. A motion control apparatus having a control circuit for controlling an object, the control circuit being inputted with a current state of said object and outputting a motion quantity by which the object is driven, comprising:

first means for changing the value of the motion quantity by adding a randomly variable quantity to the motion quantity;

second means for quantifying, by using an evaluation function, the merit of change in the current state of an object caused by application of the changed motion quantity to the object;

third means for calculating an optimum motion quantity on the basis of the changed motion quantity if the evaluation function value determined by second means is "positive", and on the basis of the changed motion quantity multiplied by −1 if the evaluation function value is "negative"; and

fourth means for correcting the values of transformation parameters of the control circuit so that an output of the control circuit takes a value nearer to the optimum motion quantity calculated by third means than the motion quantity now being outputted from the control circuit;

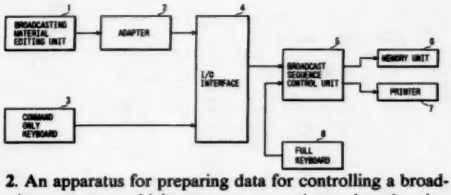
whereby said parameters are corrected while a motion control system is actually driven, to ultimately and automatically form a series of motions starting from a initial state to a target state within said control circuit.

5,063,493

METHOD OF PREPARING BROADCAST SEQUENCE CONTROL DATA AND APPARATUS FOR IMPLEMENTING SAID METHOD

Shigeo Shioiri, and Kunio Kanda, both of Chiba, Japan, assignors to Somar Corporation, Tokyo, Japan

Filed May 19, 1989, Ser. No. 353,930
Int. Cl.[5] G05B *19/04;* G11B *27/02*
U.S. Cl. 364—192 **2 Claims**



2. An apparatus for preparing data for controlling a broadcasting sequence, which apparatus comprises: a broadcasting material editing unit that edits a broadcasting material such as a broadcasting telecine film or broadcasting video tape, an adapted with which the broadcasting material related information from said broadcasting material editing unit is converted to time-related data; a command only keyboard for preparing broadcast sequence control data; an I/O device that feeds a broadcast sequence control unit with an output signal from said command only keyboard and an output signal from said adapter; the broadcast sequence control unit which performs the necessary operations for preparing broadcast sequence control data; and an output device for storing or recording the broadcast sequence control data which has been processed with said broadcast sequence control unit.

5,063,494

PROGRAMMABLE DATA COMMUNICATIONS SYSTEM

Dennis J. Davidowski, Warminster; Michael J. Saunders, and Steven M. O'Brien, both of Norristown, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 12, 1989, Ser. No. 336,980
Int. Cl.[5] G06F *9/00, 3/00, 13/00*
U.S. Cl. 395—800 **8 Claims**

1. A high speed external data communications controller for receiving data from a main memory to be transferred to a smart terminal, comprising:

a host computer system comprising an input/output control processor coupled to a main memory through a common system bus means,

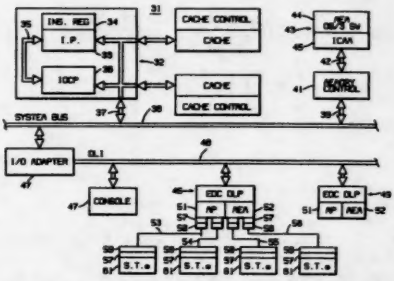
said main memory having data stored therein to be transmitted to a smart terminal,

an input/output adapter coupled between said common system bus means and a common data link interface bus,

a plurality of smart terminals coupled to said common data link interface bus,

an enhanced data communications data link processor (EDC DLP) of the type having a programmable microprocessor and a dedicated memory, for storing protocols, terminal configurations and other parameters defining the data communications system said EDC DLP being coupled between said smart terminals and said data link interface bus,

said EDC DLP providing means for receiving information from said main memory of said host computer including



data and a designated smart terminal address for receiving said data in a format unacceptable by said designated smart terminal,

said dedicated memory providing means for storing said received data,

said EDC DLP further providing means for utilizing the information stored in said dedicated memory and for formatting and pre-packaging said received data in a format acceptable by said smart terminal,

said formatted pre-packaged data including a plurality of prefix code characters and a suffix code character, and

means for transmitting said pre-packaged acceptable format text to said designated smart terminal.

5,063,495

METHOD OF ASSOCIATING DOCUMENT PROCESSING STATES WITH AN ACTION MARKET

Margaret G. MacPhail, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1988, Ser. No. 289,992
Int. Cl.[5] G06F *7/10*
U.S. Cl. 395—650 **10 Claims**

1. A method of marking a document stored within a data processing system for action, said method comprising the steps performed by said data processing system of:

inserting a begin action marker control code within said document denoting the beginning of a portion of said document on which action is to be performed;

inserting an end action marker control code within said document denoting the end of a portion of said document on which action is to be performed;

creating an action marker data object within said document and linked to a portion of said document bounded by said begin and end action marker codes, said object including

(a) a specification of a first action to be performed on said document,

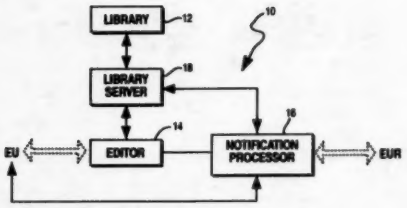
(b) an identification of a first user responsible to perform said first action on said document,

(c) a notification requirement indicating whether a second user will be notified upon reaching a particular status of the action,

(d) a specification of said particular status for triggering a notification, and

(e) an identification of a second user to receive said notification;

automatically assigning an identifier for an action to be performed on said document;



storing said identifier for said action with said action marker data object; and

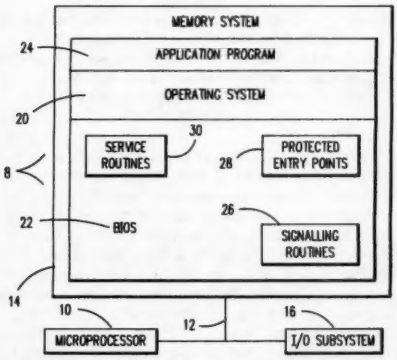
displaying, on a visual display device of said data processing system, said action marker data object to a requesting end user.

5,063,496

SIGNALING ATTEMPTED TRANSFER TO PROTECTED ENTRY POINT BIOS ROUTINE

Richard A. Dayan; Douglas R. Geisler; Scott G. Kinnear, all of Boca Raton; James F. Macon, Jr., Boynton Beach, and William H. Schwartz, Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1988, Ser. No. 201,651
Int. Cl.[5] G06F *9/00, 12/00*
U.S. Cl. 395—700 **1 Claim**



1. In a data processing system having a microprocessor; I/O device; and a memory system for storing a plurality of BIOS routines for controlling operation of said I/O devices, a plurality of application programs including interrupt instructions and hard coded instructions for initiating transfer of control to said BIOS routines, and a multitasking operating system including a plurality of interrupt instructions in a application programs for calling said BIOS routine; said memory system having a plurality of protected entry points to which control is transferred by said hard coded instructions, the improvement comprising:

first means in said memory system for storing a signalling routine for alerting said operating system of attempting access to said BIOS routines through said protected entry points;

second means in said memory system means for storing at said protected entry points jump instructions operative when control is transferred thereto by said hard coded instructions to transfer control to said signalling routine;

said operating system being operable in response to being alerted by said signalling routine to control use of an I/O device, the operation of which is controlled by one of said BIOS routines, and operable in response to said signalling routine to transfer control to said BIOS routines; and

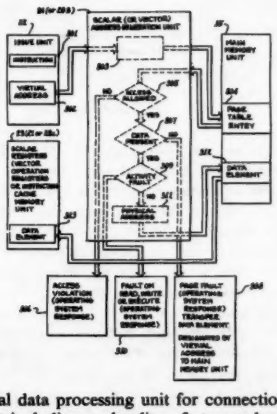
said application programs including information associated with said hard coded instructions to uniquely identify which specific BIOS routines are to be accessed.

5,063,497

APPARATUS AND METHOD FOR RECOVERING FROM MISSING PAGE FAULTS IN VECTOR DATA PROCESSING OPERATIONS

David N. Cutler, Bellevue; David A. Orbits, Redmond, both of Wash.; Dileep Bhandarkar, Shrewsbury, Mass.; Wayne Cardoza, Merrimack, N.H., and Richard T. Witek, Littleton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 1, 1987, Ser. No. 69,372
Int. Cl.[5] G06F *12/00*
U.S. Cl. 395—800 **32 Claims**



1. A digital data processing unit for connection to a main memory unit including a plurality of storage locations, each identified by a physical address, for storing vector operands and vector instructions, one type of said vector instructions being a computational instruction for initiating a computational operation, and another type of said vector instructions being a transfer vector instruction for initiating a transfer operation and identifying a virtual address, said digital data processing unit comprising:

A. a vector register for storing vector operands;

B. a vector execution unit for performing vector operations identified by vector instructions of the computational type in connection with vector operands in said vector register;

C. a vector address generating unit for performing, in response to receipt of an instruction of the transfer vector instruction type, an address translation operation to (1) generate a physical address in response to the virtual address identified by the transfer vector instruction corresponding to a physical address in said main memory unit, to enable a vector operand to be transferred between the

storage location identified by said physical address and said vector register, and (2) generate a page fault indication if said virtual address identified by said transfer vector instruction does not correspond to a physical address in said main memory unit; and

D. an instruction issue unit for interactively retrieving vector instructions from said main memory unit and performing an instruction issue operation to transfer an instruction of said computational instruction type to said vector execution unit and to transfer an instruction of said transfer vector instruction type to said vector address generating unit to enable it to perform the address translation operation, said instruction issue unit being responsive to a page fault indication from said vector address generating unit resulting from one of said vector instructions to (1) terminate performing instruction issue operations while permitting said execution unit to continue to perform vector operations identified by other ones of said vector instructions that have already been issued and (2) generate restart information to identify the vector instruction which resulted in the page fault indication.

5,063,498

DATA PROCESSING DEVICE WITH DIRECT MEMORY ACCESS FUNCTION PROCESSED AS AN MICRO-CODE VECTORED INTERRUPT

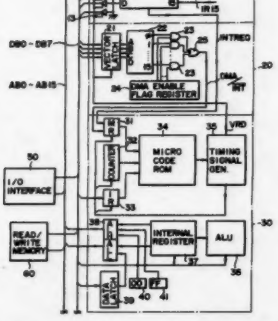
Ziro Hirahara, Yokohama, and Akihito Abe, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 29,764, Mar. 24, 1987, abandoned. This application Jul. 20, 1989, Ser. No. 383,266

Claims priority, application Japan, Mar. 27, 1986, 61-69215

Int. Cl.[5] G06F *13/28, 9/22, 13/24*

U.S. Cl. 395—425 **5 Claims**



1. A data processing device allowing a direct memory-access operation to be performed between a read/write memory and an I/O interface, said data processing device comprising:

interrupt detecting means for detecting an interrupt signal and for generating a vector corresponding to the detected interrupt signal;

control signal generating means for generating, in response to said vector, a control signal indicating whether said interrupt signal is a normal interrupt signal or a direct memory-access interrupt signal;

logical operation processing means, having a ROM storing micro-code instructions for executing a normal operation, a normal interrupt operation, and a direct memory-access operation, for sequentially reading out the micro-code instructions in order to control the execution of the normal operation and the normal interrupt operation, and for sequentially reading out the micro-code instructions in order to control the execution of the direct memory access operation when a control signal is generated by said control signal generating means in accordance with the interrupt signal requesting the direct memory access operation; and

parameter memory means for, upon the execution of said direct memory-access operation, storing parameters for use by said logical operation processing means, for reading said parameters responsive to said vector, and for supplying said parameters to said logical operation processing means.

5,063,499

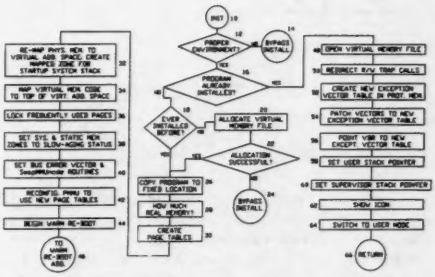
METHOD FOR A VIRTUAL MEMORY SYSTEM BY REDIRECTING ACCESS FOR USER STACK INSTEAD OF SUPERVISOR STACK DURING NORMAL SUPERVISOR MODE PROCESSING

Jonathan F. Garber, Oakland, Calif., assignor to Connectix, Inc., Menlo Park, Calif.

Filed Jan. 9, 1989, Ser. No. 294,831

Int. Cl.[5] G06F *12/02*

U.S. Cl. 395—500 **11 Claims**



11. A method of utilizign physical memory and peripheral storage in a computer system running uner an operating system, wherein the computer system includes a suitable microprocessor capable of coacting with memory management logic either internal or external to the microprocessor, and an amount of physical memory, and wherein the computer system is capable of operating in both user and supervisor modes, as virtual memory comprising the steps of:

allocating a portion of the peripheral storage as a virtual memory file,

determining the amount of the physical memory resident in the computer system,

setting the memory management logic to address at least part of the physical memory and at least part of the virtual memory file as virtual memory space, whereby there is a first portion of the virtual memory space in the physical memory and a second portion of the virtual memory space in the peripheral storage,

establishing a supervisor stack in the physical memory,

reconfiguring the computer system to continue processing, normally performed in supervisor mode, in the user mode, including establishing at least one user stack in the virtual memory space in response to an attempt by the operating system to establish a stack and forcing the operating system or at least one currently executing application program to use the at least one user stack instead of the supervisor stack as if the operating system or the at least one currently executing application program was still operating in the normal supervisor mode by redirecting the microprocessor to use the at least one user stack when the operating system or the at least one currently executing application program attempts to address any stack during processing normally performed in supervisor mode, and

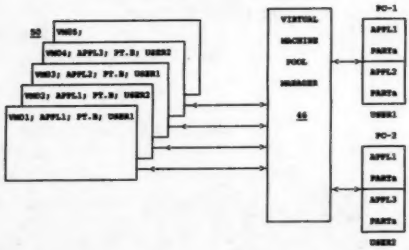
swapping between the first and second portions of the vir-

tual memory space, in accordance with a predetermined criteria, non-critical information.

5,063,500
SYSTEM FOR EXECUTING SEGMENTS OF APPLICATION PROGRAM CONCURRENTLY/SERIALLY ON DIFFERENT/SAME VIRTUAL MACHINE

David U. Shorter, Lewisville, Tex., assignor to IBM Corp., Armonk, N.J.

Filed Sep. 29, 1988, Ser. No. 250,632
Int. Cl.[5] G06F *9/06, 9/30, 9/38, 15/16*
U.S. Cl. 395—200 7 Claims



1. A method to preserve system resources during the execution of distributed application programs in an SNA type data processing network that supports program to program communication between an Intelligent Work Station (IWS) and a host processor in accordance with SNA Logical Unit 6.2 protocols when a Virtual Machine Pool Manager exists at said host processor and functions to,

(1) create a pool of virtual machines at said host processor that are brought to a run ready state prior to any said program to program communication,

(2) dynamically assign an idle run ready virtual machine to process each said request from said IWS involving one said application program so that sequential said request are assigned to different ones of said idle virtual machines and run concurrently, and

3) provide a Pool Manager Data Structure for use by said Pool Manager during said step of dynamically assigning said idle run ready virtual machines in said pool; said method comprising the following steps,

A) providing an Operating System for said IWS which attaches an process identifier (PRID) and a thread identifier (THRID) to predefined segments of said resident application program that include LU 6.2 type conversation requests,

B) transmitting said PRID and THRID identifiers to said host at the time said request is transmitted to said host to permit said Virtual Machine Pool Manager to decide based on said transmitted identifiers and previously received THRID identifiers whether to assign said request to an active or idle virtual machine in said pool,

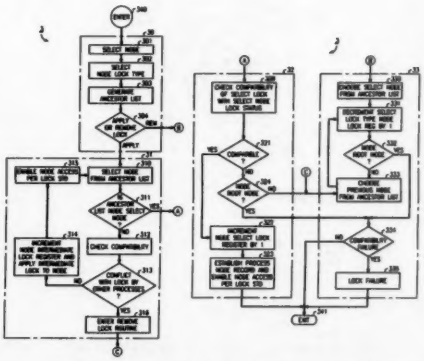
C) executing said segments concurrently on different assigned virtual machines at said host when said segments of said application program have different THRIDs, and

D) executing said segments serially on the same assigned virtual machine when said segments of said application program have the same THRIDs.

5,063,501
INFORMATION CONTROL SYSTEM FOR SELECTIVELY TRANSFERRING A TREE LOCK FROM A PARENT NODE TO A CHILD NODE THEREBY FREEING OTHER NODES FOR CONCURRENT ACCESS

John D. Jordan, Jr., Worthington, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 18, 1989, Ser. No. 452,096
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—725 14 Claims



8. A computer implemented method for controlling concurrent process operations against a complex infrastructure comprising tree structures of complex object nodes of information comprising the steps of

selectively applying in response to a request of one of the process a tree lock to a node and intermediate tree locks to each ancestral node of said node to lock said node and ancestral nodes and ones of child nodes located in a tree structure of said locked node, and

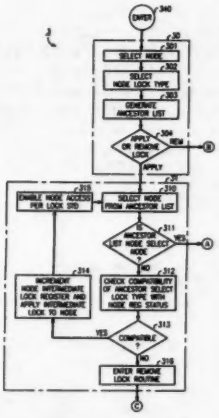
transporting in response to a subsequent request of said process said applied tree lock from said node to ones of said child nodes located in said tree structure thereby freeing said node and other child nodes located in said tree structure of said node for access by concurrently running ones of the processes.

5,063,502

INFORMATION CONTROL SYSTEM FOR COUNTING LOCK APPLICATION AGAINST COMPOSITE INFORMATION INFRASTRUCTURE

John D. Jordan, Jr., Worthington, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 18, 1989, Ser. No. 452,095
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—725 17 Claims



8. Apparatus for controlling concurrent process operations against a complex infrastructure comprising tree structures of complex object nodes wherein said apparatus comprises

means responsive to a process requesting one of node and tree reserve, exclusive and share locks for a node for selecting said node and generating a list of ancestral nodes related to and located in a tree structure of said selected node,

means operative upon selecting said node and generating said list of ancestral nodes for comparing a compatibility of an intermediate lock corresponding with said requested lock for each listed ancestral node with a current lock status of the ancestral node,

means operative upon determination of said compatibility of said intermediate lock with each ancestral node current lock status for applying said intermediate lock to the ancestral node and incrementing an accumulative count of a register corresponding with the ancestral node to record application of said intermediate lock corresponding with said requested lock,

means enabled upon incrementing all ancestral node registers and upon comparing a compatibility of said requested lock with said selected node current lock status for incrementing an accumulative count of a register corresponding with said selected node to record said requested lock as pending against said selected node and for locking said selected node in accordance with said requested lock,

means responsive to a process requesting a removal of said requested lock from said selected locked node for entering a remove lock sequence by selecting said locked node and generating a list of intermediate locked ancestral nodes located in the tree structure of said selected locked node, and

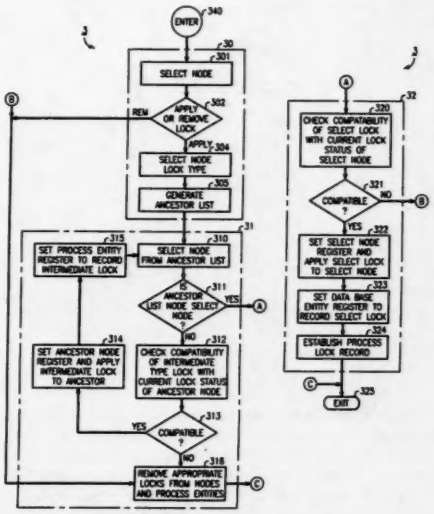
means operative upon selecting said locked node and generating said list of intermediate locked ancestral nodes for removing said selected and intermediate locks from said selected and each listed ancestral locked node and decrementing said accumulative count of each register corresponding with said selected and listed ancestral locked nodes as an indication that said requested lock and intermediate locks are removed and no longer pending against said previously locked selected and listed ancestral nodes.

5,063,503

INFORMATION CONTROL SYSTEM FOR SELECTIVELY LOCKING AN ENTITY WITH REQUESTED INTERMEDIATE RESERVE EXCLUSIVE AND SHARE LOCKS

John D. Jordan, Jr., Worthington, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 18, 1989, Ser. No. 452,094
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—725 12 Claims


ENTER
SELECT NODE
APPLY OR REMOVE LOCK
REM
APPLY
SELECT NODE LOCK TYPE
GENERATE ANCESTOR LIST
SET PROCESS ENTITY REGISTER TO RECORD INTERMEDIATE LOCK
SELECT NODE FROM ANCESTOR LIST
IS ANCESTOR LIST NODE SELECT NODE ?
YES
NO
SET ANCESTOR NODE REGISTER AND APPLY INTERMEDIATE LOCK TO ANCESTOR
CHECK COMPATIBILITY OF INTERMEDIATE TYPE LOCK WITH CURRENT LOCK STATUS OF ANCESTOR NODE
COMPATIBLE ?
YES
NO
REMOVE APPROPRIATE LOCKS FROM NODES AND PROCESS ENTITIES
CHECK COMPATIBILITY OF SELECT LOCK WITH CURRENT LOCK STATUS OF SELECT NODE
COMPATIBLE ?
NO
YES
SET SELECT NODE REGISTER AND APPLY SELECT LOCK TO SELECT NODE
SET DATA BASE ENTITY REGISTER TO RECORD SELECT LOCK
ESTABLISH PROCESS LOCK RECORD
EXIT

6. Apparatus for controlling concurrent process operations against conceptual structures each formed of entities embodied on a complex infrastructure comprising tree structures of complex object nodes wherein said apparatus comprises

means responsive to a process operation requesting one of node and tree reserve, exclusive and share locks for an entity for selecting an infrastructure node embodying said entity and generating a list of infrastructure ancestral nodes related to said selected node,

means operative upon selecting said node and generating said list of ancestral nodes for comparing a compatibility of an intermediate lock corresponding with said requested entity lock with a current lock status of each listed infrastructure ancestral node,

means operative upon determination of compatibility of said intermediate lock with said current lock status of each infrastructure ancestral node for applying said intermediate lock to each of said listed infrastructure ancestral

nodes and for setting registers corresponding with entities embodied on said ancestral nodes to record application of said intermediate lock thereto, and

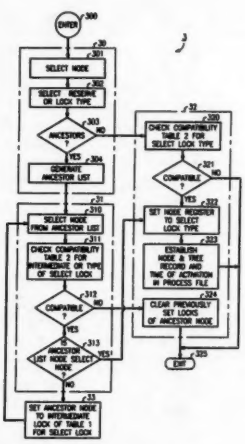
means enabled upon applying said intermediate lock to all said listed infrastructure ancestral nodes for determining compatibility of said requested lock with a current lock status of said selected infrastructure node and upon determining said compatibility for applying said requested lock to said infrastructure node and setting a register corresponding with said entity embodied on said infrastructure node to record an application of said selected lock thereto to enable process operation access to entity information stored on said locked infrastructure node.

5,063,504

INFORMATION CONTROL SYSTEM FOR RESERVE LOCKING INFRASTRUCTURE NODES FOR SUBSEQUENT EXCLUSIVE AND SHARE LOCKING BY THE SYSTEM

John D. Jordan, Jr., Worthington, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 18, 1989, Ser. No. 452,093
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—725 **16 Claims**


ENTER
SELECT NODE
SELECT REQUIRED OR LOCK TYPE
ANCESTORS ?
GENERATE ANCESTOR LIST
SELECT NODE FROM ANCESTOR LIST
CHECK COMPATIBILITY TABLE 2 FOR INTERMEDIATE OR TYPE OF SELECT LOCK
COMPATIBLE ?
IS ANCESTOR LIST NODE SELECT NODE ?
SET ANCESTOR NODE TO INTERMEDIATE LOCK OF TABLE 1 FOR SELECT LOCK
CHECK COMPATIBILITY TABLE 2 FOR SELECT LOCK TYPE
COMPATIBLE ?
SET NODE REGISTER TO SELECT LOCK TYPE
ESTABLISH NODE & TREE RECORD AND TIME OF ACTIVATION IN PROCESS FILE
CLEAR PREVIOUSLY SET LOCKS OF ANCESTOR NODE
EXIT

8. Apparatus for controlling concurrent process operations against a complex infrastructure comprising tree structures of complex object nodes wherein said apparatus comprises

means responsive to a process operation requesting a lock for selecting a node and tree structure and generating a list of ancestral nodes related to said selected node and tree structure,

means operative upon selecting said node and generating said list of ancestral nodes for comparing a compatibility of an intermediate lock corresponding with said requested lock of each listed ancestral node with a currently recorded ancestral node lock status,

means operative upon determination of compatibility of said intermediate lock with each ancestral node current recorded lock status for applying said intermediate lock to said ancestral node,

means enabled upon recording said intermediate lock as pending for all said ancestral nodes for comparing said requested lock with a current lock status of said selected node and when compatible therewith for locking said selected node in accordance with said requested lock,

means operative upon detecting a reserve lock recorded in a node and tree structure for preventing other ones of the processes from obtaining exclusive and other reserve locks on said node and tree structure having recorded said reserve lock, and

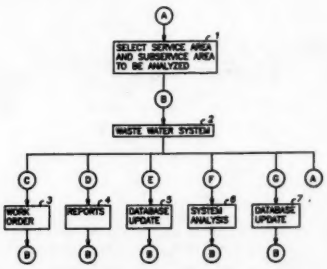
means operative upon detecting a reserve lock recorded in a node and tree structure of the infrastructure for enabling said other processes to apply share locks on said node and tree structures having recorded said reserve lock thereby enabling said other processes to concurrently read information from said reserve locked node and tree structure nodes.

5,063,505

COMPUTER AIDED MANAGEMENT SYSTEM FOR PUBLIC UTILITY WASTEWATER COLLECTION SYSTEMS

Gerry E. Pate; Ronald L. Mullinax, both of Houston; Alexander C. Sutton, Kingwood, and Jeff E. Ross, Houston, all of Tex., assignors to Pate Systems, Inc., Tex.

Filed Jun. 16, 1989, Ser. No. 368,046
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—400 **25 Claims**



1. A computer implemented method for managing a public utility wastewater collection system, the steps of which comprise:

(a) establishing a computer-accessible database, the database including wastewater collection system parameters, the collection system parameters including pipe system parameters comprised of the location, with respect to a coordinate system, of sewer pipe and manholes, the elevation of the pipe and manholes, and pipe and manhole diameter; and the collection system parameters including predicted customer wastewater input into the system along the pipe;

(b) selecting an area of the wastewater collection system for analysis;

(c) selectively reviewing portions of the database information related to the selected area;

(d) selectively modifying database parameters;

(e) determining at least one wastewater flow for a portion of the pipe system under analysis;

(f) determining at least one surface hydraulic grade for a portion of the pipe system under analysis; and

(g) comparing the surface hydraulic grade against a predetermined criteria.

5,063,506

COST OPTIMIZATION SYSTEM FOR SUPPLYING PARTS

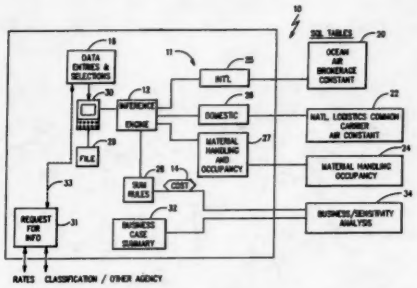
John C. Brockwell, Endicott, N.Y., and Edward J. Collins, Boulder, Colo., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 23, 1989, Ser. No. 425,615
Int. Cl.[5] G06F *15/24*
U.S. Cl. 364—402 **17 Claims**

1. A computer system for estimating the cost of supplying parts to a manufacturing facility at one or more delivery frequencies and a selected supply method, said system comprising:

first database definition means for defining a first database to simultaneously store cost information for a plurality of alternate supply methods;

option entry means for user selection of at least one of said supply methods for said parts, said supply method impacting the cost of supplying said parts to said manufacturing facility, said option entry means permitting a user to select a nonzero percentage of air transportation and a nonzero percentage of land transportation for said parts over the same leg of a supply route;



data entry means for user entry of delivery frequency data indicating one or more preferred frequencies of delivery to base a cost estimation;

storage means, coupled to said option entry means and said data entry means, for storing said selections and data; and

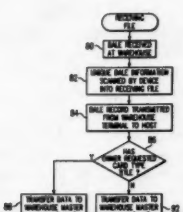
processing means, coupled to said first database and said storage means, for estimating the cost of supplying said parts at said one or more frequencies of delivery and the selected supply method.

5,063,507

GOODS DATABASE EMPLOYING ELECTRONIC TITLE OR DOCUMENTARY-TYPE TITLE

James D. Lindsey; Charles D. Hutton; Joe W. Tubb; Carol L. Shipman, and Albert S. Kyle, III, all of Lubbock, Tex., assignors to Plains Cotton Cooperative Association, Lubbock, Tex.

Filed Sep. 14, 1990, Ser. No. 582,551
Int. Cl.[5] G06F *15/40, 15/21*
U.S. Cl. 364—408 **38 Claims**


RECEIVING FILE
BALE RECEIVED AT WAREHOUSE
BALE RECORD TRANSMITTED FROM WAREHOUSE TERMINAL TO HOST
HAS OWNER REQUESTED CARD TYPE TITLE ?
TRANSFER DATA TO WAREHOUSE MASTER FILE AS "CARD"
TRANSFER DATA TO WAREHOUSE MASTER FILE AS "EMC"
PUNCH CARD AND DELIVER
LOG TRANSACTION "BOOKING"
RETURN
RETURN

1. A system for trading goods, comprising:

a program-controlled computer;

a data base accessible by said computer, said data base being adapted for storing information concerning the goods;

a multi-field record associated with each of the goods, each said record having a field indicating whether the respective goods are represented by an electronic title or by a documentary title;

a plurality of terminals for accessing said data base and for trading the goods; and

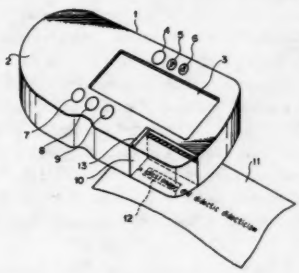
said program-controlled computer causing either an authentic documentary title to be created if the data base indicates the goods are to be represented by documentary title, or causes an authentic electronic title to be created with respect to the goods if the data base so indicates, whereby only one type of title exists at any one time with respect to the goods.

5,063,508

TRANSLATION SYSTEM WITH OPTICAL READING MEANS INCLUDING A MOVEABLE READ HEAD

Yoshimi Yamada; Kazuo Ito, and Hideo Tanimoto, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1990, Ser. No. 496,192
Claims priority, application Japan, Mar. 22, 1989, 1-69930
Int. Cl.[5] G06K *9/00*
U.S. Cl. 364—419 **8 Claims**



1. A portable electronic dictionary which reads an objective word in a source language by optical scanning and displays information in a target language about the objective word, comprising:

a case;

optical character reading means, having a read range, for optically scanning the objective word on a document while the case is held stationary on the document with the objective word located within the read range of the optical character reading means, the optical character reading means being movably mounted with the case; and

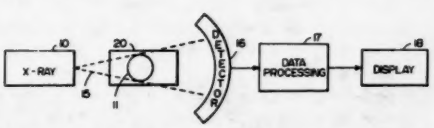
moving means for moving the optical character reading means inside the case.

5,063,509

METHOD FOR DETERMINING DENSITY OF SAMPLES OF MATERIALS EMPLOYING X-RAY ENERGY ATTENUATION MEASUREMENTS

Mary E. Coles, Addison, and Ernest L. Muegge, Grand Prairie, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 26, 1990, Ser. No. 470,478
Int. Cl.[5] G01D *18/00*
U.S. Cl. 364—420 **10 Claims**



1. A method for determining the bulk density of a sample of interest, comprising the steps of:

(a) selecting a first plurality of samples of a first variety of materials having different known densities, the materials of said first plurality having relatively low atomic numbers, such that said samples attenuate X-rays incident thereon due to Compton scattering;

(b) irradiating each of said first plurality of samples in turn

with at least first and second beams X-rays, from sources emitting beams of X-rays at differing energies;

(c) employing detector means to collect X-rays of said beams passing through said samples;

(d) measuring amounts of X-rays collected by the detector means to determine the attenuation of the beams of X-rays of differing energies by each of the first plurality of samples;

(e) determining the parameters defining a linear relation between the attenuation of the X-rays due to Compton scattering in the first plurality of samples and the bulk densities of the samples;

(f) selecting a second plurality of samples of a second variety of materials having different known densities, the materials of said second plurality of samples having relatively high atomic numbers such that said second plurality of samples attenuate X-rays incident thereon due to both Compton scattering and photoelectric absorption;

(g) irradiating each of said second plurality of samples in turn with at least first and second beams of X-rays from sources emitting beams of X-rays at differing energies;

(h) employing detector means to collect X-rays passing through the samples of said second plurality of samples;

(i) measuring the amount of X-rays collected by the detector means to determine the attenuate of the beams of X-rays of differing energies of each of the second plurality of samples;

(j) determining parameters defining a linear relation between the attenuation of X-rays due to photoelectric absorption in the second plurality of samples and the energy of the X-rays;

(k) using the linear relation between the attenuation of X-rays due to photoelectric absorption and the energy of the X-rays determined in step (j), and the linear relationship between the absorption of X-rays due to Compton scattering in a material sample and the bulk density of the material of the sample determined in step (e), to define a linear relation defining the bulk density of the materials of the second plurality of samples as a function of the measured total attenuation of the two beams X-rays at two different energies by the given material; and

(l) determining the bulk density of a section of a sample of interest by:

(1) irradiating the sample of interest with first and second beams of X-rays from sources emitting beams of X-rays at two differing energies;

(2) employing detector means to collect X-rays passing through the section of the sample of interest;

(3) measuring the amount of X-rays collected to determine the total attenuation of the beams of X-rays by the section of the sample of interest; and

(4) employing the relationship defined in step (k) to determine the bulk density of the section of the sample of interest;

(m) performing said step (l) with respect to a number of sections of the sample of interest;

(n) carrying out said steps (l) and (m) repetitively with the source and detector disposed in differing positions with respect to the sample of interest; and

(o) generating a computed tomographic image of a cross-section of the sample of interest, employing the values for the bulk density ρ of the plural portions of the sample of interest which are determined in each performance of steps (l), (m) and (n).

5,063,510

PROCESS FOR THE ADAPTIVE CONTROL OF AN INTERNAL-COMBUSTION ENGINE AND/OR ANOTHER DRIVE COMPONENT OF A MOTOR VEHICLE

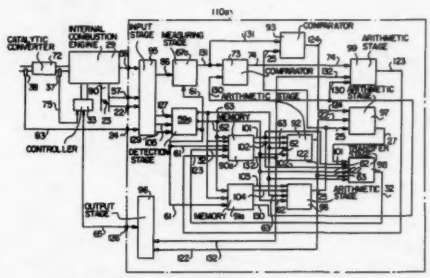
Gunter Jürgens, Waiblingen; Udo Sürig, Stuttgart, and Lothar Lang, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,530

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825749

Int. Cl.[5] **B60K** *41/08*

U.S. Cl. 364—424.1 **22 Claims**



1. A process for adaptive control of a drive component in a motor vehicle having an internal-combustion engine, the drive component having a critical time interval with respect to a controlled variable for a predefined operating behavior of the drive component at selected operating points, the process comprising the steps of:

detecting an occurrence of a non-steady operating state of the drive component using a detection means (59);

obtaining a selected set value for the critical time interval from a memory means (91) upon detecting said non-steady operating state for one of the selected operating points, said memory means storing a first characteristic map of set values assigned to the selected operating points of the internal-combustion engine including speed and load information on the selected operating points;

obtaining an actual value for the critical time interval from a measuring means (67) upon detecting said non-steady operating state for the one selected operating point;

comparing said selected set value with the actual value in a comparison means (73) and determining whether any deviation exceeds a threshold value;

calculating a selected updated correction value for controlling the controlled variable with regard to the predefined operating behavior using an arithmetic means (99) if said deviation exceeds the threshold value;

entering (123) said selected updated correction value into a second characteristic map for correction values assigned to the selected operating points of the internal combustion engine and using said selected updated correction value to control the controlled variable (132) for a subsequent non-steady operating state of the drive component at its assigned selected operating point wherein a new selected updated correction value is entered for each occurrence of a subsequent non-steady operating state having a deviation exceeding the threshold value;

interpolating selected set values received from said memory means (91) for selected operating points neighboring a non-selected operating point in a second arithmetic means (66) to obtain a non-selected set value ($t_{set(ZW)}$) (25) for a non-steady operating state occurring at the non-selected operating point;

interpolating selected correction values received from a second memory means (90) for selected operating points neighboring the non-selected operating point in a third

arithmetic means (92) to obtain a non-selected instantaneous correction value (K_{ZW}) (122) for the non-steady operating state occurring at the non-selected operating point;

controlling said controlled variable (122) with said non-selected instantaneous correction value;

comparing said non-selected set value ($t_{set(ZW)}$) with the actual value in a second comparison means (93) and determining whether any deviation exceeds the threshold value;

calculating a theoretical new correction value ($K_{new(ZW)}$) in a fourth arithmetic means (97) for the non-selected operating point when the deviation exceeds the threshold value;

calculating a transferred correction value ($K_{new(u)}$) in a transfer stage means (98) from the theoretical new correction value ($K_{new(ZW)}$) taking into account positional deviation of the non-selected operating point relative to the neighboring selective operating points;

entering in the second characteristic map said transferred correction value ($K_{new(u)}$) at one of said neighboring selected operating points; and

employing the selected updated correction value and the non-selected instantaneous correction value for controlling the drive component of the motor vehicle.

5,063,511

ENHANCED MISSED SHIFT RECOVERY FOR SEMI-AUTOMATIC SHIFT IMPLEMENTATION CONTROL SYSTEM

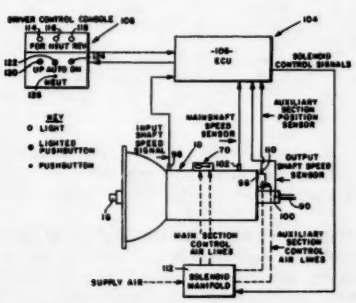
William J. Mack, Clarkston, and Ronald K. Markyvech, Allen Park, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 19, 1989, Ser. No. 368,492

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.[5] B60K *41/18*

U.S. Cl. 364—424.1 20 Claims



1. A control system (104) for controlling the implementation of selected shifts of a mechanical change gear transmission system comprising a fuel throttle controlled engine (E), a multi-speed change gear mechanical transmission (10), a master friction clutch (C) drivingly interposed between the engine and the transmission, a first sensor (98) for providing a first input signal indicative of transmission input shaft (16) rotational speed, a second sensor (100) for providing a second input signal indicative of the rotational speed of a transmission shaft (90) independently rotatable relative to the transmission input shaft under at least certain transmission operating conditions and a transmission actuator (112, 70, 96) for controlling shifting of the transmission, said control system characterized by;

means (120, 124/132) for selecting an upshift or a downshift from a currently engaged transmission ratio or from neutral to a selected ratio, and providing a third input signal indicative therefor;

a central processing unit (106) for receiving said first, second and third input signals and for processing the same in accordance with predetermined logic rules to issue command output signals, said central processing unit including;

means responsive to (i) a selection of a shift from a currently engaged ratio or from neutral into a selected ratio and (ii) confirmation of a transmission neutral condition for (i) initiating the start up of a timing member, (ii) and thereafter sensing substantial synchronization of the transmission and (iii) thereafter for issuing command output signals to said actuator to enable the transmission to be shifted into the selected ratio;

said means sensing substantial synchronization of said transmission by comparing said first signal to a first reference range if the timer indicates a time period less than a reference time and comparing said first signal to a second reference range if the timer indicates a time period greater than the reference time, said first and second ranges determined as a function of the selected ratio to be engaged and the current value of said second input signal, said second range being larger than said first range.

5,063,512

CONTROL UNIT OF ACTIVE SUSPENSION SYSTEM OF VEHICLE

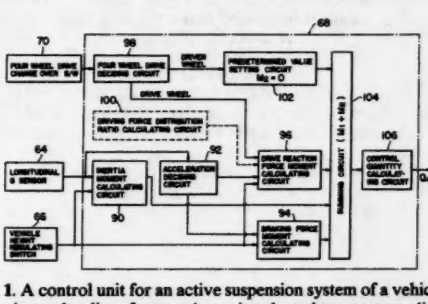
Katsuyoshi Kamimura, Tochigi; Atsushi Mine, and Yutaka Hiwatashi, both of Gunma, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1989, Ser. No. 410,843

Claims priority, application Japan, Sep. 30, 1988, 63-246241

Int. Cl.[5] B60G *17/01*

U.S. Cl. 364—424.05 9 Claims


FOUR WHEEL DRIVE CHANGE OVER S/W
FOUR WHEEL DRIVE DECIDING CIRCUIT
DRIVER SPEED
PREDETERMINED VALUE SETTING CIRCUIT
DRIVE WHEEL
DRIVING FORCE DISTRIBUTION RATIO CALCULATING CIRCUIT
LONGITUDINAL G SENSOR
INERTIA MOMENT CALCULATING CIRCUIT
ACCELERATION DECIDING CIRCUIT
DRIVE REACTION FORCE MOMENT CALCULATING CIRCUIT
CONTROL QUANTITY CALCULATING CIRCUIT
VEHICLE HEIGHT REGULATING SWITCH
BRAKING FORCE MOMENT CALCULATING CIRCUIT

1. A control unit for an active suspension system of a vehicle having a plurality of suspension units adapted to corresponding wheels and supporting a vehicle body by pressure of a fluid, each suspension unit including a suspension arm adapted to connect to the vehicle body for vertical pivotal movement about a pivotal center, the active suspension system having vertical relative displacement sensing means for sensing the vertical relative displacement between masses above and below each suspension unit to generate a vertical relative displacement signal, vertical g sensing means for sensing vertical acceleration of the vehicle body to generate a vertical g signal, fluid charging and discharging means for selectively charging the fluid into and discharging the fluid from each suspension unit, first control instruction quantity calculating means for calculating first control instruction quantity of the fluid to be charged into and discharged from each suspension unit in response to the vertical relative displacement signal and the vertical g signal and for producing a first control instruction quantity signal representing the first control instruction quantity and fluid charge and discharge control means responsive to the first control instruction quantity for producing a control signal to the fluid charging and discharging means, the improvement which comprises:

longitudinal g sensing means for sensing longitudinal acceleration of the vehicle body to generate a longitudinal g signal;

first moment calculating means for calculating a first moment about the pivotal center of each suspension arm due

to the inertia force of the vehicle body from said longitudinal g signal and a set vehicle height signal;

first deciding means for deciding whether the vehicle is accelerated or decelerated to generate a decision signal indicating one of both acceleration and deceleration of the vehicle;

second moment calculating means for calculating a second movement about the pivotal center of each suspension arm due to the braking force exerted on the vehicle and the set vehicle height signal when the decision signal indicates deceleration of the vehicle and for calculating the second movement about the pivotal center of each suspension arm with respect to a corresponding drive wheel due to a drive reaction force against a driving force exerted to the vehicle and the set vehicle height signal when the decision signal indicates acceleration;

suspension reaction force variation calculating means for calculating the suspension reaction force variation for each suspension unit from the first and second moments to generate a suspension reaction force variation signal representing the suspension reaction force variation;

control instruction quantity calculating means for calculating a second control instruction quantity of the fluid to be charged into and discharged from each suspension unit in response to the suspension reaction force variation to generate a control instruction quantity signal; and

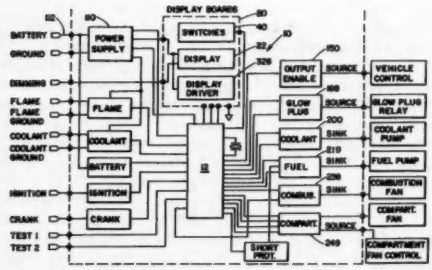
summing means responsive to the first and second control instruction quantity signal for adding the first control instruction quantity to the second control instruction quantity and for producing a total control instruction quantity to the fluid charge and discharge control means, wherein the total control instruction quantity of the fluid controls the vehicle body in the normal position.

5,063,513

VEHICLE PREHEATER CONTROL

David W. Shank, Big Rapids, and Nadi S. Findikli, Reed City, both of Mich., assignors to Nartron Corporation, Reed City, Mich.

Filed Jun. 15, 1990, Ser. No. 538,900
Int. Cl.[5] B60H *1/22*; G05D *23/00*
U.S. Cl. 364—424.05 **14 Claims**



8. A method of heating a motor vehicle with an auxiliary heater prior to starting a motor vehicle engine comprising the steps of:

a. setting a motor vehicle start time corresponding to a projected start of said motor vehicle engine;

b. at a predetermined time prior to said start time sensing an ambient temperature; and

c. based on said sensed ambient temperature activating said auxiliary heater at a time prior to said start time to heat said motor vehicle.

12. Apparatus comprising:

a. an auxiliary heating system for transferring heat energy to a motor vehicle engine cooling system comprising:

i. a combustion heater having an igniter which, when energized causes a fuel to burn and give off energy for heating a coolant within said cooling system; and

ii. a pump for circulating heated coolant through said cooling system to transfer heat away from said coolant;

b. an igniter circuit for energizing said igniter;

c. control circuitry including an output for activating said igniter circuit at a time before an anticipated vehicle start time based upon sensed temperature;

d. a sensor for monitoring an ambient temperature and coupling a signal corresponding to the ambient temperature to said control circuit;

e. an input unit mounted a vehicle passenger compartment for transmitting a projected vehicle start time to said control circuit; and

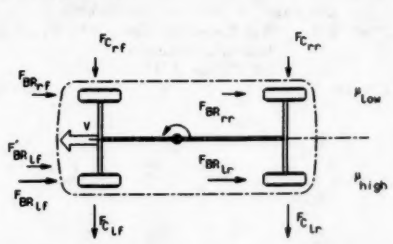
f. said control circuit determining an igniter activation time based upon sensed temperature and projected vehicle start time.

5,063,514

ABS YAW CONTROL

Philip M. Headley, Brighton, and Prakash K. Kulkarni, Novi, both of Mich., assignors to General Motors Corporation, Detroit, Mich. and Delco Electronics Corp., Kokomo, Ind.

Filed Jun. 19, 1990, Ser. No. 540,250
Int. Cl.[5] G06F *15/50*; B60T *8/58*, *8/64*
U.S. Cl. 364—426.02 **12 Claims**



8. A system for controlling brake pressure applied to respective brakes of left and right wheels of an axle of a vehicle traveling over a road surface, the system comprising in combination:

means for measuring slip between each of the left and right wheels and the road surface;

means for detecting an incipient lockup condition of each wheel resulting from the measured slip between that wheel and the road surface exceeding a respective slip threshold of that wheel;

means for detecting a yaw condition of the vehicle resulting from the wheels being braked on respective portions of the road surface having different friction coefficients;

means for determining the wheel being braked on the portion of the road surface having the highest friction coefficient;

means for decreasing the slip threshold of the wheel being braked on the portion of the road surface having the highest friction coefficient, when a yaw condition is detected;

means for individually decreasing the brake pressure applied to the brake of each wheel in response to a detected incipient lockup condition of that wheel to allow wheel recovery from the incipient lockup condition; and

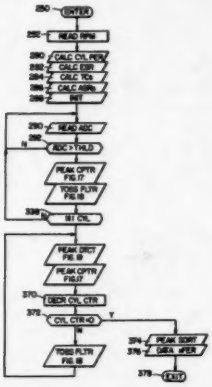
means for individually increasing brake pressure to the brake of each wheel following recovery of that wheel from the incipient lockup condition.

5,063,515

AUTOMOTIVE ENGINE SIGNAL DIGITIZATION

Neil W. Kunst; James D. Fraser, and Josephina Amaro, all of Tucson, Ariz., assignors to Clean Air Technologies Inc., New York, N.Y.

Filed Jun. 30, 1989, Ser. No. 374,026
Int. Cl.[5] G01M *15/00*
U.S. Cl. 364—431.01 17 Claims



1. Apparatus for digitizing a cyclical automotive cylinder ignition signal having a maximum value occurring at spark and varying frequency and amplitude thereafter, comprising:

sensor means, for providing a sensed signal indicative of the actual value of an automotive cylinder ignition parameter; and

signal processing means, responsive to said sensed signal, for sampling of said sensed signal at first predetermined time intervals and providing signals indicative of the value of said sensed signal sampled thereat, for comparing each said sampled first interval signal to a predetermined threshold signal to determine a transition occurrence of said sensed signal towards a maximum spark value, for sampling of said sensed signal, following said sensed signal transition occurrence, at said second intervals for a predetermined number of said second intervals and providing signals indicative of the value of said sensed signal sampled thereat, for determining a maximum spark value signal from among said sampled second interval signals, for sampling of said sensed signal, following said predetermined number of second intervals, at said third intervals and providing signals indicative of the value of said sensed signal sampled thereat, said first, second and third intervals being shorter in duration than a fourth predetermined time interval, and for determining a maximum displacement signal during each said fourth interval as the one of said sampled third interval signals sampled during an associated one of said fourth intervals having the greatest absolute value displacement from a maximum displacement signal determined during a preceding one of said fourth intervals.

5,063,516

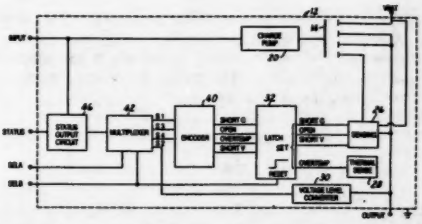
SMART POWER DRIVER SYSTEM FOR A MOTOR VEHICLE

Saad A. Jamoua, Oak Park; Melvin J. Sarnowsky, Livonia, both of Mich., and Karl R. Heck, Pheonix, Ariz., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 21, 1989, Ser. No. 396,206
Int. Cl.[5] G01R *31/02*
U.S. Cl. 364—431.11 4 Claims

1. An apparatus for determining fault operation in systems which couple electrical power to actuators within a motor vehicle, comprising:

power driver means mounted on a module having a signal input pin, a status output pin, and a status input in, said power driver means including switching means responsive to application of electrical energy to said signal input pin for the coupling of electrical power to the actuator, said power driver means including monitoring means for monitoring a plurality of electrical operating parameters of said switching means and for providing a corresponding plurality of fault type indications to said status output pin in response to application of a first sampling signal to said status input pin, said monitoring means also including feedback means for providing a proportion of the coupled electrical power to said status output pin in response to application of a second sampling signal to said status input pin;



performing monitoring means for periodically sampling said plurality of fault type indications from said status output pin upon applying said first sampling signal to said status input pin during vehicular operation and providing corresponding output indications; and

self test means for generating a self test mode upon initial vehicle key on and providing said second sampling signal to said status input pin, said self test means providing an electrical self test signal to said signal input pin for a predetermined time insufficient to actuate the actuator during said self test mode, said self test means storing electrical power occurring at said status output pin during said predetermined time in a first storage location and storing electrical power occurring at said status output pin after said predetermined time in a second memory location, said self test means subsequently providing an exclusive nor comparison of said first memory location to second memory location to provide a self test fault indication and providing a corresponding self test output indication.

5,063,517

PROFILE REVISING METHOD

Masaki Seki; Takashi Takegahara, both of Tokyo, and Takeshi Arakaki, Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP88/01261, § 371 Date Aug. 14, 1989, § 102(e) Date Aug. 14, 1989, PCT Pub. No. WO89/06005, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 13, 1988, Ser. No. 397,453
Claims priority, application Japan, Dec. 17, 1987, 62-319389
Int. Cl.[5] G05B *19/18*
U.S. Cl. 364—474.22 12 Claims

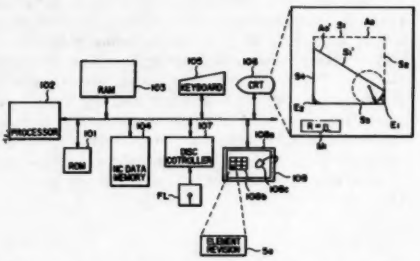
1. A profile revising method for revising a profile having figure elements, the profile defines a corner shape having a chamfered shape, rounded shape or the like, said method comprising the steps of:

(a) displaying, on a display screen, a revised profile which does not include the corner shape when the figure elements other than those corresponding to the corner shape are revised;

(b) checking whether insertion is possible when the corner

shape is inserted into the revised profile and generating an error if insertion is not possible;

(c) displaying dimensions of the corner shape where the error occurred on the display screen and painting the corner shape where the error occurred in a color different



from that of other portions of the profile when the error is generated in step (b);

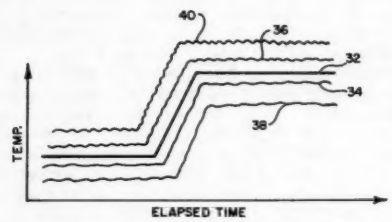
(d) inserting, when the corner shape where the error occurred is revised, a revised corner shape into the revised profile and displaying the same.

5,063,518

ALARM SYSTEM FOR A CRYSTAL GROWING FURNACE

Victor Curreri, Steauket; John Klein, Port Washington, and Janine Dubois, Shirley, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 16, 1989, Ser. No. 437,420
Int. Cl.[5] G06F *15/46*; H05B *1/02*
U.S. Cl. 364—503 **2 Claims**



1. A method for monitoring adjacent temperature zones of a furnace exhibiting a spacial normal temperature profile, the method comprising the steps:

storing the normal temperature profile in memory;

storing a first pair of additional temperature profiles in memory, these profiles mimicking the normal profile and establishing permissible operational positive and negative temperature tolerances relative to the normal temperature profile;

storing a second pair of temperature profiles in memory, these profiles mimicking the normal profile and overlying the first profile pair for establishing positive and negative temperature limits respectively greater in value than the corresponding profiles of the first pair;

sequentially measuring the temperature in each of the zones;

comparing each measured zone temperature with the first pair of profiles, a measured value outside this pair establishing at least a warning condition;

generating a signal for announcing the warning condition;

comparing each measured zone temperature with the second pair of profiles, a measured value outside this pair establishing a shut down condition; and

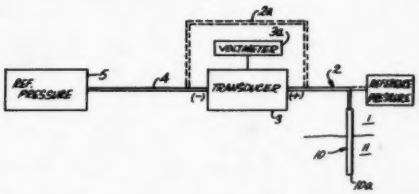
shutting down the furnace upon occurrence of a shut down condition.

5,063,519

LANDFILL GAS PRODUCTION TESTING AND EXTRACTION METHOD

Stanley W. Zison, Irvine, Calif., assignor to Pacific Energy, Commerce, Calif.

Filed Sep. 18, 1989, Ser. No. 408,715
Int. Cl.[5] G01N *7/14*; E21B *43/22*
U.S. Cl. 364—510 **24 Claims**



1. A method of determining flow of a gas component through a surface of ground, the method comprising the steps of:

measuring a gas pressure at a selected depth below the surface multiple times at each of a first plurality of locations with respect to the surface over a predetermined period to obtain a temporal average gas pressure for the predetermined period at each of the first plurality of locations and a spatial distribution of the average gas pressure;

determining pneumatic permeability of the ground at a second plurality of locations with respect to the surface to obtain a spatial distribution of permeability;

measuring a gas component at a third plurality of locations to obtain a spatial distribution thereof; and

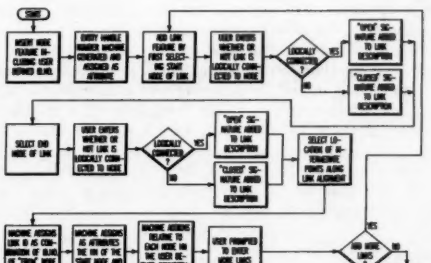
determining gas component flow through the surface based on the temporal average gas pressures and their spatial distribution and the spatial distributions of permeability and gas component.

5,063,520

COMPUTER AIDED PROCESS FOR NETWORK ANALYSIS

Dennis H. Klein, 347 Hazel Ave., Mill Valley, Calif. 94941

Filed Jul. 6, 1990, Ser. No. 549,066
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—512 **20 Claims**



1. A process for the creation of a graphic network display within a computer system containing a video display, comprising the steps of:

(a) inserting a node feature onto a graphic display, and assigning a user ID number to the feature;

(b) assigning a machine readable entity handle number to the inserted node feature;

(c) inserting additional node features into said graphic dis-

play, and assigning both user ID numbers and machine readable entity handle numbers to each of the inserted features

(d) adding linking features between and connecting the inserted nodes;

(e) selecting the start node of a link and entering the connectivity condition, either open or closed of the node to link connection;

(f) selecting the end node of a link and entering its connectivity conditions, either open or closed;

(g) selecting an intermediate point along a link alignment and assigning a link user ID number, and attributes to that point;

(h) automatically assigning an entity handle number to intermediate point;

(i) repeating steps (a) through (h) until the network is graphically completely described.

5,063,521

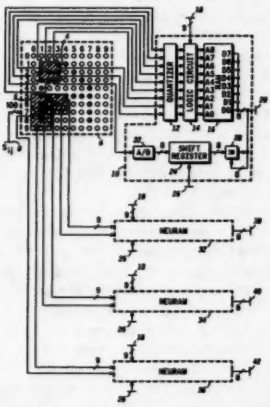
NEURAM: NEURAL NETWORK WITH RAM

William M. Peterson, Scottsdale; Christopher N. Hume, Mesa, and Robert H. Leivian, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1989, Ser. No. 431,424

Int. Cl.[5] G06F *15/18*

U.S. Cl. 395—27 13 Claims



3. An apparatus for storing an input signal matrix applied at a plurality of inputs thereof, comprising:

first means coupled to the plurality of inputs of the apparatus for receiving and quantizing the input signal matrix into a first digital address at an output;

second means having an input coupled to said output of said first means and responsive to a digital address control signal for sequentially generating a plurality of second digital addresses at an output from said first digital address, said plurality of second digital addresses including said first digital address and predetermined variations thereof perturbed by at least one bit;

memory means having an address input coupled to said output of said second means for receiving said plurality of second digital addresses and having a data port coupled for reading data from an addressable memory location within said memory means and writing data to said addressable memory location within said memory means;

third means having an input coupled to one of the plurality of inputs of the apparatus for receiving a first signal of the input signal matrix and providing a digital output signal at an output;

fourth means coupled to said output of said third means for receiving said digital output signal of said third means and responsive to a weight signal for providing a weighted digital output signal; and

fifth means for summing said weighted digital output signal as applied at a first input with said data read from said addressable memory location as applied at a second input from said data port of said memory means, said fifth means having an output coupled to said data port of said memory means for providing said data written to said addressable memory location.

5,063,522

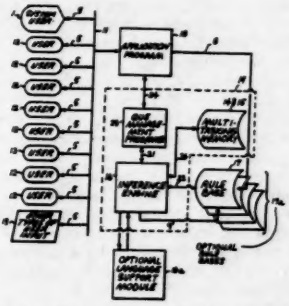
MULTI-USER, ARTIFICIAL INTELLIGENT EXPERT SYSTEM

Ralph A. Winters, Sherman Oaks, Calif., assignor to Intellisystems, Inc., Chatsworth, Calif.

Continuation of Ser. No. 168,253, Mar. 15, 1988, abandoned. This application Jul. 10, 1990, Ser. No. 551,764

Int. Cl.[5] G06F *15/18*

U.S. Cl. 395—51 16 Claims



1. A method, utilizing a computer, for creating an expert system accessible by a plurality of users, said expert system comprising at least one rule base, said at least one rule base comprising knowledge for solving problems, said expert system for providing said rule base knowledge from said at least one rule base to said plurality of users, said method comprising the steps:

coordinating communications between said plurality of users and said expert system, said communications comprising at least one inquiry and at least one response to and from said at least one rule base;

placing each said at least one inquiry of each said at least one response in a packet for temporary storage, said packet including identification information for at least one user of said plurality of users, said identification information including an identifier of said at least one rule base, an identifier of said at least one user, and an identifier of the current rule base state and event;

processing each said at least one inquiry or each said at least one response in said packet entirely before processing a next packet,

buffering said at least one response or said at least one inquiry in said packet in a first and a second queue, where said first queue buffers said at least one inquiry or said at least one response from at least one of said plurality of users to said at least one rule base, and said second queue buffers said at least one inquiry or said at least one response from said at least one rule base to said at least one user;

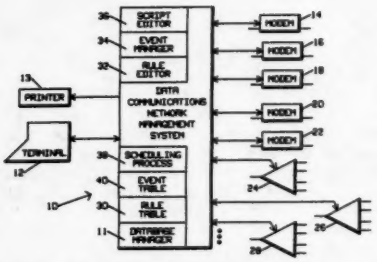
for each of said packets, inferencing said at least one inquiry or said at least one response of said packets stored on said first queue buffer with said knowledge contained in said at least one rule base.

5,063,523

NETWORK MANAGEMENT SYSTEM WITH EVENT RULE HANDLING

Milan J. Vrenjak, Coral Springs, Fla., assignor to Racal Data Communications Inc., Sunrise, Fla.

Filed Nov. 16, 1989, Ser. No. 438,375
Int. Cl.[5] G06F *15/16, 13/42*
U.S. Cl. 364—514 **16 Claims**



8. A method for establishing and using a rule to react to a network event occurring in a data communication network, comprising in combination the steps of:

a network management system user defining a criterion associated with said network event upon occurrence of which an action will be taken;

a network management system user defining a SCRIPT of commands to be invoked upon occurrence of said event meeting said criterion in order to produce said action;

receiving an event message from an object in said network;

in a computer based data communication network management system, said network management system having been developed by a designer to operate in a predetermined normal manner for use by said network management system user, comparing attributes of said event message with said user defined criterion; and

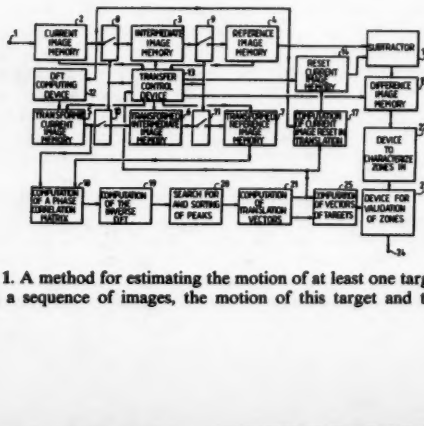
if said attributes match said user defined criterion, invoking said SCRIPT of commands to effect customized operation of said predetermined normal manner of operation of network management system.

5,063,524

METHOD FOR ESTIMATING THE MOTION OF AT LEAST ONE TARGET IN A SEQUENCE OF IMAGES AND DEVICE TO IMPLEMENT THIS METHOD

Alain Ferre, Cesson Sevigne; Christophe Chevance, Rennes, and Jean Quignon, Crepy en Valois, all of France, assignors to Thomson-CSF, Puteaux, France and Cummings Incorporated, The International Sign Service, Nashville, Tenn.

Filed Nov. 9, 1989, Ser. No. 433,790
Claims priority, application France, Nov. 10, 1988, 88 14677
Int. Cl.[5] G06F *15/70;* H04N *5/14*
U.S. Cl. 364—516 **3 Claims**


CURRENT IMAGE MEMORY
INTERMEDIATE IMAGE MEMORY
REFERENCE IMAGE MEMORY
SUBTRACTOR
DFT COMPUTING DEVICE
TRANSFER CONTROL DEVICE
RESET CURRENT IMAGE MEMORY
DIFFERENCE IMAGE MEMORY
TRANSFORMED CURRENT IMAGE MEMORY
TRANSFORMED INTERMEDIATE IMAGE MEMORY
TRANSFORMED REFERENCE IMAGE MEMORY
MULTIPLICATION OF CURRENT IMAGE BY ITSELF
DEVICE TO CHARACTERIZE ZONES IN
COMPUTATION OF A PHASE CORRELATION MATRIX
COMPUTATION OF THE INVERSE DFT
SEARCH FOR AND SORTING OF PEAKS
COMPUTATION OF TRANSLATION VECTORS
COMPARISON OF VECTORS OF TARGETS
DEVICE FOR VALIDATION OF ZONES

1. A method for estimating the motion of at least one target in a sequence of images, the motion of this target and the motion of the background of the images being comparable to translations, said method consisting in the steps of:

sampling each image, then representing each sample by the value of its luminance;

computing, for each image, a matrix of coefficients transformed by the two-dimensional discrete Fourier transform;

computing a phase correlation matrix, each coefficient of which is equal to the product of a transformed coefficient of a first image, by the conjugate of a homologous transformed coefficient of a second image, divided by the square of the modulus of this product;

computing an inverse transformed matrix of the phase correlation matrix, in applying the inverse Fourier transform to the phase correlation matrix;

making a first comparison, with a predetermined threshold value, of the coefficients of the inverse transformed matrix of the phase correlation matrix and searching for that coefficient which has the greatest modulus, this coefficient corresponding to a translation of the image background, while the other coefficients having a modulus greater than the value of the first threshold correspond to possible targets;

then estimating a translation vector for each possible target and a translation vector of the image background, in a reference position related to the first image, on the basis of the order (x) of the row and of the order (y) of the column in which there is located the coefficient corresponding respectively to each target and to the background of the image, in the inverse transformed matrix of the phase correlation matrix;

resetting the background of the first image in relation to the background of the second image, as a function of the translation vector estimated for the background;

computing the absolute values of the differences in luminance between the first image, the background of which has been reset, and the second image, these values of differences in luminance constituting an image called a difference image;

comparing the absolute values of the differences in luminance with a second predetermined threshold value; each pixel with a difference in luminance greater than the second threshold value being considered as a pixel in motion;

attributing each pixel in motion to a zone formed by pixels that are in motion and are adjoining;

computing a speed vector for each zone, in computing a vector of translation of this zone from a first difference image to a second difference image;

computing a speed vector for each target, as a function of the translation vector estimated for this target and as a function of translation vector estimated for the image background;

concluding that a zone belongs to a target when its speed vector coincides with the speed vector of a target.

5,063,525

PICTURE PROCESSING APPARATUS INCLUDING DATA CONVERSION TABLE FOR PERFORMING CONVOLUTIONAL PROCESSING

Mitsuo Kurakake; Shoichi Otsuka, both of Hino, and Yutaka Muraoka, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 130,237, Nov. 25, 1987, abandoned. This application Jul. 9, 1990, Ser. No. 549,237
Claims priority, application Japan, May 27, 1986, 61-121994
Int. Cl.[5] G06F *15/66;* G06K *9/54*
U.S. Cl. 395—157 **8 Claims**

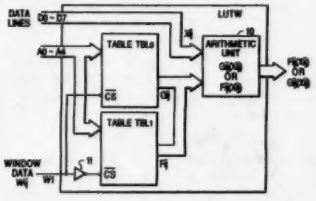
1. A picture processing apparatus including a data conversion table for performing convolutional processing for effecting data processing by selecting a particular operator from a plurality of operators for performing predetermined operations, such as digitization, density conversion, or image reversal, on pixel data forming a pciture which is stored in a frame

memory, and for simultaneously effecting mask processing with window data, said picture processing apparatus comprising:

data lines for providing data;

a plurality of data conversion tables in which a plurality of operators corresponding to address positions of the pixel data are arrayed and stored;

address input lines, coupled to said data conversion tables, for inputting address data which correspond to addresses of pixel data output from the frame memory, to each of said data conversion tables;



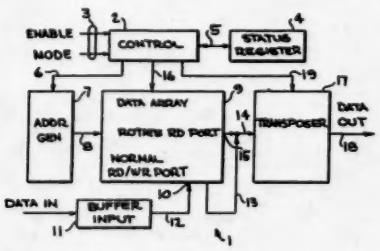
window data lines, coupled to said data conversion tables, for window data for providing window data to first predetermined ones of said data conversion tables and inverted window data to second predetermined ones of said data conversion tables; and

arithmetic means coupled to said plurality of data conversion tables and said data lines, for receiving the output data from said data conversion tables and the data from said data lines, and for processing and outputting the output data.

5,063,526
BIT MAP ROTATION PROCESSOR

Koichi Kagawa, Fuchu, Japan; Chung-Li Yu, San Jose, Calif.; Shinkyo Kaku, San Jose, Calif., and Vinod Menon, Sunnyvale, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 3, 1987, Ser. No. 57,850
Int. Cl.[5] G06F *15/40, 15/62*
U.S. Cl. 395—155 **23 Claims**



19. An apparatus comprising:

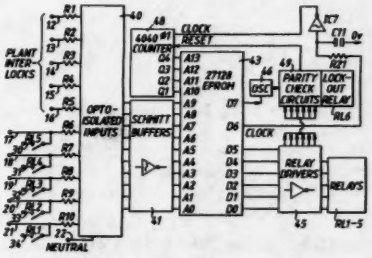
storing means, having a first output port and a second output port, for storing data, the storing means including an array of data locations storing respective units of the data, the data locations being accessible through the first output port and the second output port, the first output port accessing normal sets of data locations in response to array addresses, and the second output port accessing rotated sets of data locations in response to array addresses, wherein the array includes at least R+1 normal sets, and a normal set includes a word of data having N+1 units, NU_n, for n equal to 0 through N, and a rotated set includes award of data having R+1 units, where a given rotated set includes one unit NU_n, from each of R+1 normal sets; and

generating means, connected to the storing means, for generating sequences of array addresses for accessing the data through the first output port and the second output sort.

5,063,527
MONITOR SYSTEM

Barry L. Price, and Christopher J. Thornhill, both of Solihull, England, assignors to British Gas plc, London, England

Continuation of Ser. No. 149,527, Jan. 28, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 500,232
Claims priority, application United Kingdom, Jan. 29, 1987, 8701964
Int. Cl.[5] F23Q *23/00*
U.S. Cl. 364—550 **30 Claims**



1. A monitor system for monitoring a microprocessor based control device having an output for effecting control of a system by means of control information therefrom in dependence on reference information received from system sensors of physical parameters in safety critical situations, said monitor system being configured without the requirement of a further microprocessor and including first input means for receiving said control information from the output of the microprocessor based control device; second input means for receiving reference information from the system sensors;

memory means having address inputs continuously receiving both the control information and the reference information form the first and second input means respectively to define in combination an accessed memory address wherein the contents of said accessed memory address is used for continuously determining whether the control information from the device corresponds to that expected in view of the reference information; and means for overriding the control information if any error in this control information is detected.

5,063,528
RECORD POSITION MEASURING APPARATUS

Hiroshi Miwa, Amagasaki; Atuko Miyoshi, Fukuyama; Syungi Satou, Fukuyama, and Masayuki Kaseda, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 28, 1989, Ser. No. 386,120
Int. Cl.[5] B41F *5/08*
U.S. Cl. 364—559 **13 Claims**

1. A recorded pattern position measuring apparatus comprising:

a recording medium having at least one color pattern defined by a number of different color elements;

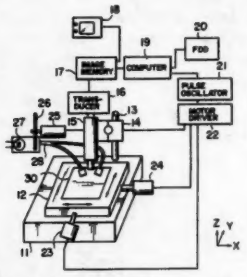
a light source which irradiates light onto said recording medium;

a light filtering means for dividing light from said source and reflected from the pattern on said recording medium into a plurality of predetermined wavelength bands;

two-dimensional imaging means for recording images of the color pattern and providing image intensity information for each of the different colors in the form of change between "0" and "1", determined according to whether

light of the predetermined wavelength bands has an intensity value that exceeds a preset threshold intensity value;

an image memory which stores the image intensity information in the form of "0" or "1" as words in memory matrix; and



means for determining boundaries of each of the different color elements using boundary data points and for calculating printing displacement of the different colors based upon location of the boundaries.

5,063,529

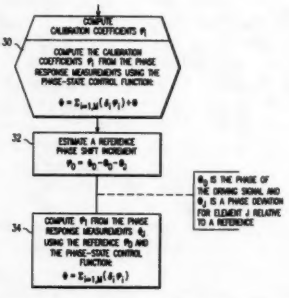
METHOD FOR CALIBRATING A PHASED ARRAY ANTENNA

Charles W. Chapoton, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1989, Ser. No. 459,046

Int. Cl.[5] G01S 7/40

U.S. Cl. 364—571.02 **27 Claims**



27. A method of calibrating a phased array antenna with N phase shift elements, each having a predetermined number of calibration coefficients and a phase response characterized by a phase-state control function $\Phi_J=f(\phi_{i=1,M},c)$, comprising the steps:

inputting calibration signals to the antenna, causing I and Q aperture response;

for a selected phase shift element, selecting a set X of control words so as to minimize the R_I and R_Q residual components of the aperture response attributable to the non-selected elements;

for each control word X, measuring the resultant I and Q aperture responses to an input calibration signal;

estimating said R_I and R_Q residual components of the aperture response, and the signal output amplitude for the selected element, from the I and Q aperture responses using the identity $(I_x-R_I)^2+(Q_x-R_Q)^2=S^2$;

for the selected element, selecting a set Y of control words;

selecting control words for the non-selected elements such that a selected phase increment is added to the residual vector R_I/R_Q to rotate it to be substantially orthogonal to the phase response vector;

for each control word Y, measuring the resultant I and Q aperture responses to an input calibration signal;

adjusting the phase of the input calibration signals to rotate the residual vector R_I/R_Q and the phase response vector such that the vector outputs appear primarily in respective I and Q channels;

measuring the phase responses Φ_J from the I and Q aperture responses using the R_I and R_Q residual components and the S signal amplitude, and using at least one of the inverse functions

$$\Phi_J=\cos^{-1}((I_y-R_I)/S)$$

$$\Phi_J=\sin^{-1}((Q_y-R_Q)/S)$$

computing calibration coefficients for the selected element from said phase response measurements using the phase state control function; and

correcting phase response errors during phase steering operations using said calibration coefficients.

5,063,530

METHOD OF ADDING/SUBTRACTING FLOATING-POINT REPRESENTATION DATA AND APPARATUS FOR THE SAME

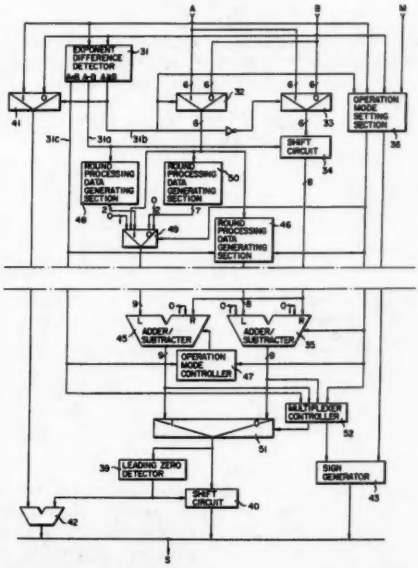
Tadashi Ishikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 31, 1989, Ser. No. 359,145

Claims priority, application Japan, May 31, 1988, 63-132977

Int. Cl.[5] G06F 7/38

U.S. Cl. 364—748 **6 Claims**



1. A floating point representation data adding/subtracting apparatus comprising:

operation mode setting means for setting one of addition and subtraction modes as an operation mode in accordance with first and second operation data and an input operation instruction, each of the first and second operation data being normalized floating-point representation data and having a sign, an exponential part, and a mantissa part, the operation mode being selected in accordance with a magnitude relation between the exponential parts of the

first and second operation data and the operation instruction;

first selecting means for selecting the mantissa part of the first operation data as a first mantissa part when the exponential part of the first operation data is equal to or larger than the exponential part of the second operation data;

second selecting means for selecting the mantissa part of the second operation data as a second mantissa part when the exponential part of the first operation data is equal to or larger than the exponential part of the second operation data;

shifting means for shifting the second mantissa part of the second operation data to lower digits with respect to a floating-point in accordance with a difference between the exponential parts of the first and second operation data, and selectively adding shifted-out digits as first guard digits to the shifted second mantissa part in accordance with the difference to obtain first processing data;

operation mode control means for generating an operation mode control instruction in accordance with the operation mode and the magnitude relation between the exponential parts of the first and second operation data;

first processing data preparing means for adding first logic guard digits as second guard digits to the first mantissa part when the exponential part difference between the first and second operation data is not 0 or the addition mode is set, the logic guard digits which the most significant bit of bits of an nth digit is 1, and zero guard digits to the first mantissa part when the exponential part difference is 0 in the subtraction mode, to obtain second processing data;

second processing data preparing means for adding second logic guard digits as third guard digits to the first mantissa part when the exponential part difference between the first and second operation data is 2 or more in the subtraction mode, the second logic guard digits which the most significant bit of bits of an nth digit is 1, and zero guard digits to the first mantissa part when the exponential part difference is 0 or 1 in the subtraction mode or the addition mode is set, and adding third logic guard digits to a lowermost digit of the first mantissa part in the addition mode, the third logic guard digits which the most significant bit of bits of an nth digit is 1, to obtain third processing data;

first adding/subtracting means for executing a first operation of the plurality of operations on the first and second processing data and selectively executing rounding at a first predetermined digit in accordance with the operation mode;

second adding/subtracting means for executing a second operation of the plurality of operations on the first and third processing data simultaneously with said first adding/subtracting means and selectively executing rounding at a second or third predetermined digit in accordance with the operation mode control instruction; and

selecting means for selecting one of results of the plurality of operations as a resultant mantissa part in accordance with the operation mode and the magnitude relation between the exponential parts of the first and second operation data, an operation resultant data of the first and second operation data including a resultant sign, a resultant exponential part, and the resultant mantissa part, and

wherein each digit is hexadecimal.

5,063,531

OPTICAL NEURAL NET TRAINABLE IN RAPID TIME

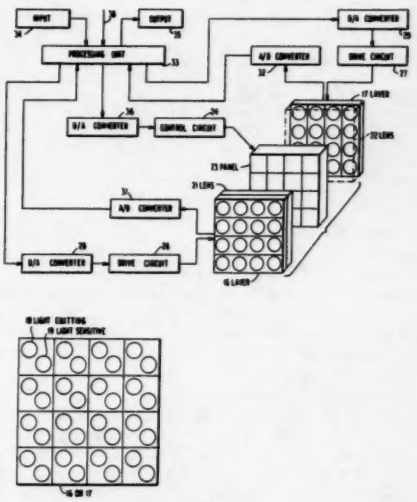
Shigeru Kawai, and Keiichi Kubota, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,185

Claims priority, application Japan, Aug. 26, 1988, 63-213125; Aug. 26, 1988, 63-213126; Aug. 26, 1988, 63-213128; Aug. 26, 1988, 63-213130

Int. Cl.[5] G06G 7/16

U.S. Cl. 395—25 **5 Claims**



1. An optical computer comprising:

a first and a second layer, each comprising pairs of light emitting and light sensitive elements in rows and columns, the light emitting elements being connected along the rows and the columns in said first and said second layers, respectively, the light sensitive elements being connected along the rows and the columns in said first and said second layers, respectively, the pairs in said first layer and the pairs in said second layer being in one-to-one correspondence to define a plurality of optical paths with each optical path defined between one of the pairs in said first layer and one of the pairs in said second layer that corresponds to said one of the pairs in said first layer;

first means connected to the rows of the light emitting elements of said first layer for making the light emitting elements of said first layer emit first primary amounts of light along said optical paths;

second means connected to the columns of the light emitting elements of said second layer for making the light emitting elements of said second layer emit second primary amounts of light along said optical paths;

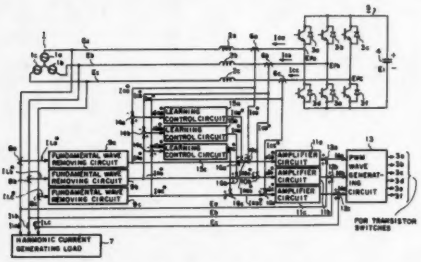
a panel comprising optical intensity controlling elements in said optical paths, respectively, for controlling said first primary amounts of light into first controlled amounts of light and said second primary amounts of light into second controlled amounts of light; and

control means, connected to the rows of the light sensitive elements of said first layer, the columns of the light sensitive elements, of said second layer, and said controlling elements for controlling said controlling elements in proportion to the first controlled amounts of light received by the light sensitive elements of said second layer, respectively, and the second controlled amounts of light received by the light sensitive elements of said first layer, respectively.

5,063,532
ACTIVE FILTER DEVICE

Masatoshi Takeda; Tomohiko Aritsuka, and Yoshitaka Tachibana, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,611
Claims priority, application Japan, Mar. 4, 1988, 63-52035
Int. Cl.[5] H02M *7/539*
U.S. Cl. 364—825 **3 Claims**



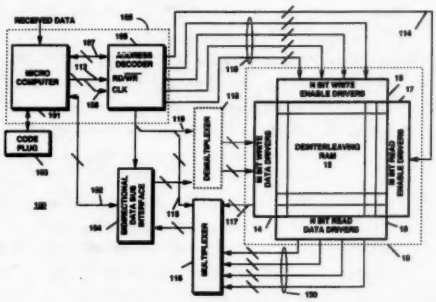
1. An active filter device, comprising:
an active filter circuit for generating an output current as a function of a current command value;
a harmonic current generating load for generating a harmonic current in response to said output current;
first deviation calculation means for calculating a deviation between said output current and said harmonic current and outputting the result as a deviation value;
a control circuit, comprising a first memory for storing a deviation value delayed by a prescribed amount of time and a second memory for storing a deviation value corresponding to a previous period of said harmonic current, and a first arithmetic circuit for combining the delayed and previous deviation values to produce a compensation value and storing the compensation value in said second memory as said previous deviation value;
a second arithmetic circuit for adding said compensation value to said harmonic current to produce a compensated harmonic current; and
second deviation calculation means for calculating a deviation between said output current and said compensated harmonic current to produce said current command value.

5,063,533
RECONFIGURABLE DEINTERLEAVER/INTERLEAVER FOR BLOCK ORIENTED DATA

Richard A. Erhart, Boynton Beach; Barry W. Herold, and Joan S. DeLuca, both of Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 10, 1989, Ser. No. 335,394
Int. Cl.[5] G06F *12/00*
U.S. Cl. 395—425 **24 Claims**

1. A random access memory comprising:
a plurality of memory cells configured as an array of N bit rows by M bit columns (where M and N are positive integers), each memory cell having an input for writing a data bit, and an output for reading the data bit;
a plurality of write enable devices, each having a write enable input, a write data input, and a write data output, said write data output of each device being coupled to an individual one of said memory cell inputs;
M data input lines, each of said data input lines being coupled to a row of write data inputs;
N write enable input lines, each of said write enable input lines being coupled to a column of write enable inputs;
a plurality of read enable devices, each having a read enable input, a read data input, and a read data output, said read data input of each device being coupled to an individual one of said memory cell outputs;
N data output lines, each of said data output lines being coupled to a column of read data outputs; and

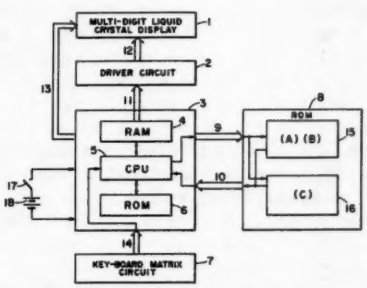


M read enable input lines, each of said read enable input lines being coupled to a row of read enable inputs.

5,063,534
ELECTRONIC TRANSLATOR CAPABLE OF PRODUCING A SENTENCE BY USING AN ENTERED WORD AS A KEY WORD

Juji Kishimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 917,249, Oct. 8, 1986, abandoned, which is a continuation of Ser. No. 778,272, Sep. 12, 1985, abandoned, which is a continuation of Ser. No. 707,165, Feb. 28, 1985, abandoned, which is a continuation of Ser. No. 294,862, Sep. 1, 1981, abandoned. This application Oct. 12, 1989, Ser. No. 420,730
Claims priority, application Japan, Sep. 8, 1980, 55-123484
Int. Cl.[5] G06F *15/38;* **G06G** *7/60*
U.S. Cl. 364—419 **6 Claims**



1. An electronic translator capable of producing a sentence by using an entered word as a key word, said translator comprising:
input means for entering a plurality of words;
memory means comprising:
means for storing words of a first language and memory address data for each said first-language word;
means for storing words of a second language and memory address data for each said second-language word, the first and second languages being distinct from each other;
means for storing sentences of the first language and memory address data associated therewith and associated with one or more first-language words; and
means for storing sentences of the second language and memory address data associated therewith and associated with one or more second-language words, said second language sentences corresponding respectively to the sentences of the first language,

wherein at least two first language words have a common memory address data associated therewith and associated with at least one common first language sentence;

access controlling means for controlling access to said memory means, comprising:

means for selecting and reading out upon input of a first-language word by said input means, first-language sentences associated with memory address data associated with said input first-language word;

means for selecting and reading out upon input of either of said first-language words associated with the common memory address data, said at least one common first language sentence;

means for selecting and reading out upon input of a plurality of first-language words, at least one first language sentence associated with memory address data comprising memory address data associated with each of said plurality of first-language words;

sentence translation instruction means for accessing the second-language sentence corresponding to a first-language sentence which a user of said translator wishes to translate, from among the first-language sentences read out by said access controlling means; and

display means for displaying a first-language word entered by said input means and for displaying said first language sentences associated with memory address data associated with said input first-language word and selected and read out by said access controlling means.

5,063,535

PROGRAMMING CONFLICT IDENTIFICATION SYSTEM FOR REPRODUCTION MACHINES

Craig W. Jacobs, Fairport, and Joseph L. Filion, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 16, 1988, Ser. No. 272,041

Int. Cl.[5] G06F *15/00, 3/14, 11/08*

U.S. Cl. 395—575 **3 Claims**

1. A method for programming a reproduction machine and identifying programming conflicts that occur, comprising:

a) using an interactive display with touch display screen, inputting desired program selections;

b) where a program selection error is made, generating an error message;

c) queuing said error message with other error messages for different programming selections in a predetermined order in an error message queue table;

d) displaying at least one error message from said queue table on said touch display screen;

e) selectively displaying a job table on said touch display screen in which the program selections made are displayed;

f) highlighting the program selections displayed in said job table for said one error message by a first visual identifier;

g) highlighting the program selections displayed in said job table for other error messages in said queue table by a second visual identifier;

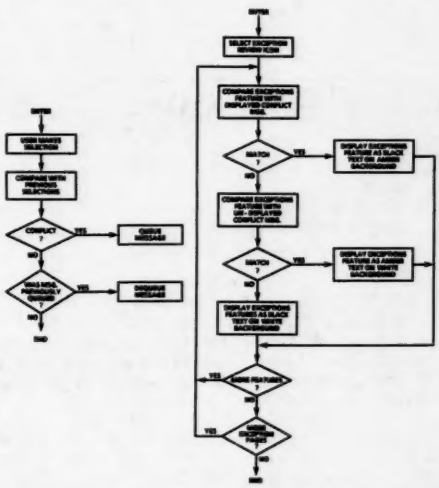
h) in response to correction of said program selection error;

1) deleting said one error message from said queue table and from said touch display screen,

2) terminating highlighting of the program selections for said one error message by said first visual identifier in said job table;

3) displaying the next error message in said queue table on said touch display screen,

4) changing highlighting of the program selections displayed in said job table for said next error message from said second visual identifier to said first visual identifier; and



j) repeating step h until all of said program selection errors are corrected.

5,063,536

MICROPROGRAMMABLE ASYNCHRONOUS CONTROLLERS FOR DIGITAL ELECTRONIC SYSTEMS

Richard F. Tinder, Pullman, and Richard I. Klaus, Vancouver, both of Wash., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Mar. 11, 1988, Ser. No. 167,311

Int. Cl.[5] G06F *7/00*

U.S. Cl. 395—775 **56 Claims**

1. An electronic asynchronous digital controller, comprising:

means for receiving information indicative of at least one system input;

means for storing a present state code which is indicative of a present state which the controller has assumed from a plurality of possible states;

means for transitioning said means for storing a present state code, from one state code to another state code;

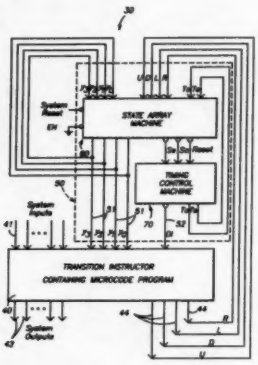
means for analyzing the present state code to determine a state class associated with the present state from at least two possible state classes;

means for analyzing the present state code and system inputs to determine whether transition instructions should issue;

means for issuing transition instructions indicating any desired state transition which should be made;

transition control means for detecting the issuance of any transition instruction and assuring that any previous transition has been sufficiently completed and then providing a transition command signal to said means for transition-

ing to thus cause said means for storing a present state code to transition from the present state which is classified in a first state class, into a new present state which is



classified in a second state class different from said first state class; and

means for translating the new present state code into appropriate output signals used to control related equipment.

5,063,537

REPROGRAMMABLE LOGIC FUSE BASED ON A 6-DEVICE SRAM CELL FOR LOGIC ARRAYS

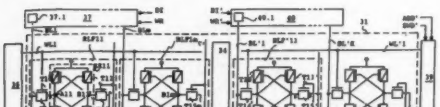
Chekib Akrout, Ris Orangis; Pierre Coppens, Savigny le Temple; Yves Gautier, Lesigny, and Pierre-Yves Urena, Vence, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1989, Ser. No. 414,339

Claims priority, application European Pat. Off., Oct. 28, 1988, 88480069

Int. Cl.[5] G11C *7/00, 11/412, 17/16*

U.S. Cl. 365—96 **10 Claims**



2. A Reloadable Programmable Logic Array or RPLA comprising:

a) a logic AND array including:

a plurality of first electrically isolated word lines carrying first word signals;

a plurality of first electrically isolated bit lines carrying first bit signals;

said first word and bit lines together forming a first matrix of non-conductive intersections;

a plurality of first input lines carrying first digital input signals;

a plurality of first output lines carrying first output signals;

said first input and output lines together forming a second matrix of non-conductive intersections;

b) a logic OR array including;

a plurality of second electrically isolated word lines carrying second word signals;

a plurality of second electrically isolated bit lines carrying second bit signals;

said second word and bit lines together forming a third matrix of non-conductive intersections;

a plurality of second input lines carrying second digital input signals;

a plurality of second output lines carrying output signals;

said second input and output lines together forming a fourth matrix of non-conductive intersections;

c) a plurality of reprogrammable logic fuses disposed at each respective couple of said first and second and said third and fourth intersections, at least one of said reprogrammable logic fuses in the AND array and in the OR array comprising:

a static RAM cell biased between first and second voltages having first and second common nodes to store control data therein;

a first FET device having a first source electrode connected to one said bit line, a first drain electrode connected to said first common node, and a first gate electrode connected to the corresponding said word line; and

a second FET device having a second electrode connected to said second common node, a third electrode connected to said input line, and a fourth electrode connected to said output line.

5,063,538

OPTOELECTRONIC SIGNAL RECORDING MEDIUM AND METHOD OF MAKING SAME

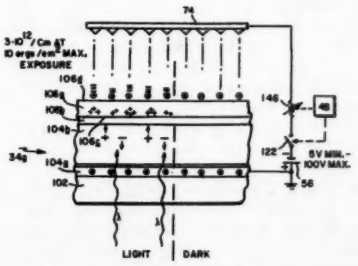
Manfred R. Kuehnle, Waldesruh Rte. 103A, New London, N.H. 03257

Filed Aug. 30, 1989, Ser. No. 400,852

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—106 **19 Claims**



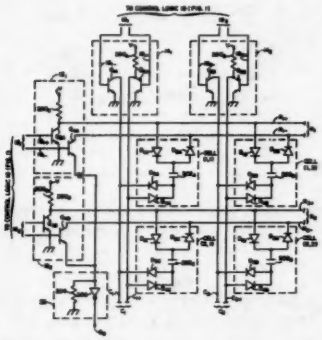
1. In a plural layer optoelectronic recording medium in sheet or strip form of the type including a base layer having a surface and a light modulating layer added to said surface of the base layer the improvement wherein the base layer is a thin monocrystal of an inorganic material and whose crystal orientation and surface perfection are such as to enable the growth on said surface of a thin light modulating layer composed of an inorganic crystalline material with a very high degree of perfection from nucleation sites on said surface so that the entire medium has a coherent crystal morphology.

5,063,539

FERROELECTRIC MEMORY WITH DIODE ISOLATION

Krishna Rallapalli, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 265,384, Oct. 31, 1988, abandoned.
This application Oct. 5, 1990, Ser. No. 593,528
Int. Cl.[5] G11C *11/22*
U.S. Cl. 365—145 11 Claims



1. An improved memory comprising:
(a) a first row control line and a second row control line;
(b) a first column control line and a second column control line;
(c) a ferroelectric capacitor having a first terminal and a second terminal, wherein:
(i) said first terminal is connected to the first row control line via a first diode having its cathode coupled to the first terminal;
(ii) said first terminal is connected to the second row control line via a second diode having its anode coupled to the first terminal;
(iii) said second terminal is coupled to the second column control line via a third diode having its anode coupled to the second terminal; and
(iv) said second terminal is coupled to the first column control line via a fourth diode having its cathode coupled to the second terminal.

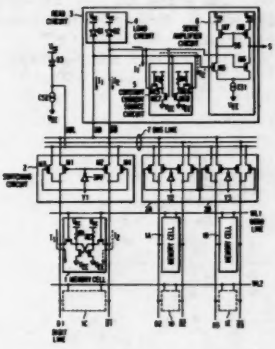
5,063,540

SEMICONDUCTOR MEMORY CIRCUIT WITH DIODE LOAD CIRCUITS

Hiroyuki Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 8, 1991, Ser. No. 652,725
Claims priority, application Japan, Feb. 8, 1990, 2-30159
Int. Cl.[5] G11C *11/36*
U.S. Cl. 365—175 4 Claims

1. A semiconductor memory circuit transmitting information in a memory cell connected to a selected word line and a selected digit line pair to a sense amplifier through a data bus line pair, wherein the information of said memory cell is read by sensing a potential difference generated at load diodes by supplying a cell current through either of said digit line pair in accordance with memory data of said memory cell, said load diodes being respectively connected to said digit line pair or



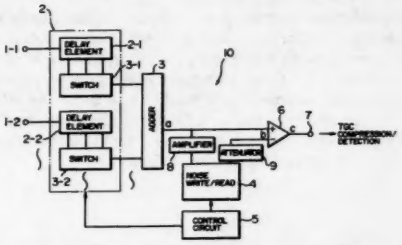
data bus line pair as load elements to supply the information stored in said memory cell to said sense amplifier.

5,063,541

BEAM FORMING METHOD AND APPARATUS THEREFOR IN ULTRASONIC IMAGING SYSTEM

Shin-ichi Kondo, Kodaira; Kageyoshi Katakura, Tokyo, and Hiroshi Ikeda, Hachioji, all of Japan, assignors to Hitachi Medical Corp., Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 500,907
Claims priority, application Japan, Mar. 31, 1989, 1-082336
Int. Cl.[5] G03B *42/06*
U.S. Cl. 367—7 28 Claims

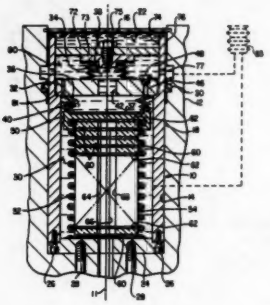


1. A beam forming method in an ultrasonic imaging system, said method comprising the steps of:
(a) actuating delay switches for dynamic focusing to operate in a section in which no ultrasonic wave transmission/-reception is performed;
(b) adding the respective outputs of said delay switches to each other by means of an adder;
(c) storing a switching noise signal into a memory means, said switching noise signal being generated from said delay switches and appearing at the output of said adder;
(d) transmitting an ultrasonic wave by means of an array of transducers so as to receive an echo signal of said transmitted ultrasonic wave and for switching said delay switches so as to obtain a reception wave beam;
(e) adding the respective outputs of said delay switches to each other by means of said adder;
(f) reading said stored noise signal out of said memory means; and
(g) calculating a difference between the output signal of said adder and the read-out noise signal to thereby obtain a signal which is a reception signal from which said switching noise so far superimposed thereon has been eliminated.

5,063,542
PIEZOELECTRIC TRANSDUCER WITH DISPLACEMENT AMPLIFIER

Steven G. Petermann, Plano; Keith W. Katahara, Allen, and Herbert A. Wolcott, II, Dallas, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 17, 1989, Ser. No. 354,067
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—166 8 Claims



1. A signal generating transducer useful in acoustic logging tools and the like comprising:

actuator means comprising at least one piezoelectric element which is operable to be elongated in one direction in response to an electrical signal imparted to said piezoelectric element;

a displacement member; and

amplifier means interconnecting said actuator means and said displacement member, said amplifier means including a first axially extensible bellows member defining a first liquid-filled chamber, a second axially extensible bellows member defining a second liquid-filled chamber, and means forming a passage interconnecting said first and second chambers for communicating liquid between said chambers and operable to effect linear movement of said displacement member greater than the elongation of said piezoelectric element in response to an electrical signal imposed on said piezoelectric element.

5,063,543
TIMER PROGRAMMING APPARATUS

Kenichi Shibuya; Hirotsugu Okubo, both of Tokyo, and Yukio Furudate, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

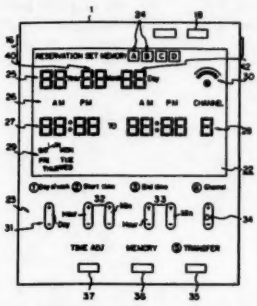
Division of Ser. No. 360,420, Jun. 2, 1989. This application Jul. 23, 1990, Ser. No. 556,177
Claims priority, application Japan, Jun. 6, 1988, 63-139069; Jun. 8, 1988, 63-141368
Int. Cl.[5] G04B *17/24;* G04C *9/00*
U.S. Cl. 368—29 8 Claims

1. A timer apparatus having a date display section comprising:

means for setting the date display to a desired date;

said display section comprising segmented display units, in which each segment thereof is controllably energized, alone or in combination; and

operating means for changing the energizing of the segments to form a plurality of abstract segment pattern displays, wherein said plurality of abstract segment pattern displays

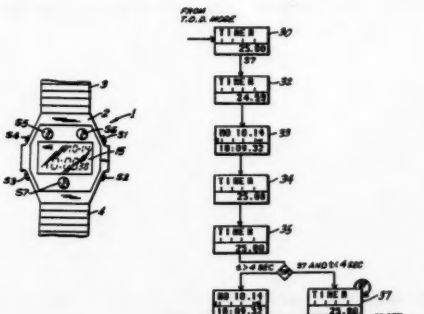


are rapidly and sequentially output for a period time until the setting of the desired date is finished.

5,063,544
PROGRAM TO ALTER ALARM SETTING IN A MULTIMODE ALARM TIMEPIECE

Tom Thinesen, Sunnyvale, Calif., assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 28, 1990, Ser. No. 500,327
Int. Cl.[5] G04B *32/02*
U.S. Cl. 368—74 5 Claims



1. In a multimode electronic timepiece having a display, an audible alarm device, a plurality of manually actuated switches, and an integrated circuit programmed to provide a plurality of modes including a first mode in which an alarm sounding setting is displayed, said alarm sounding setting being alterable in response to actuation of a selected setting switch, and a second mode in which said alarm sounding setting is not displayed, but in which said audible alarm device may be disabled by actuation of a selected disabling switch, and alarm control means responsive to said alarm sounding setting for

initiating sound from said audible alarm device and for terminating sound by a first actuation of said selected disabling switch when the audible alarm device is active, the improvement comprising:

pop-up mode means responsive to said alarm control means when the timepiece is in said second mode for causing the timepiece to change to said first mode and to display said alarm sounding setting in said first mode,

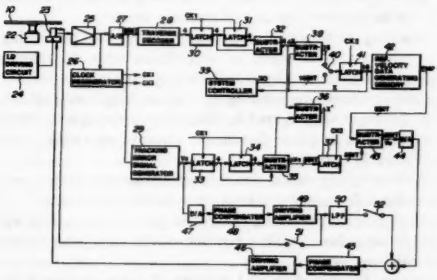
means for altering said alarm sounding setting within a preselected time while in said first mode by actuation of said selected setting switch, and

timer means for causing the timepiece to return to said second mode after said preselected time with an unaltered alarm sounding setting if said selected setting switch has not been actuated within said preselected time.

5,063,545
ACCESS SPEED DETECTING MEANS FOR DISC PLAYER

Norio Nishida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,443
Claims priority, application Japan, Dec. 8, 1988, 63-310568
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—32 **14 Claims**



1. Apparatus for detecting the speed with which a light beam of an optical head accesses a selected one of several data tracks on an optical disc of the type having recorded in said tracks traverse data representing respective track numbers, said traverse data being read by said optical head, said apparatus comprising:

traverse data detection means for detecting traverse data read from said recording tracks to produce traverse data signals indicative of light beam scanning position;

first speed data forming means for detecting deviations in said traverse data signal produced by said traverse data detection means at predetermined time intervals for forming M upper order data bits representing access speed;

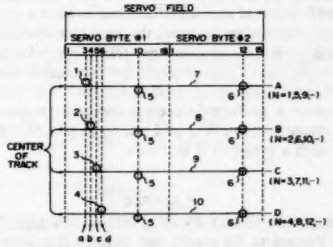
tracking error means for producing tracking error data signals proportionate to a deviation of said light beam from a record track on said optical disc; and

second speed data forming means for detecting deviations in said tracking error data signals produced by said tracking error means for forming N lower order data bits representing access speed.

5,063,546
OPTIC DISC WITH SERVO PATTERN AND APPARATUS FOR ACCESSING THE OPTICAL DISC

Osamu Ito; Masaharu Ogawa; Kyosuke Yoshimoto; Kunimaro Tanaka; Teruo Furukawa, and Yoshiki Nakajima, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,671
Claims priority, application Japan, Mar. 13, 1987, 62-59537; Jun. 2, 1987, 62-138585; Jun. 16, 1987, 62-149586
Int. Cl.[5] G11B 7/085
U.S. Cl. 369—32 **12 Claims**



1. An optical disc and apparatus for accessing the optical disc wherein the optical disc includes a plurality of information tracks, each information track having a servo field including a pair of wobbled pits and a clock pit serving as a reference pit for information data,

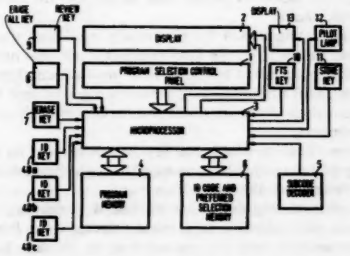
the optical disc further including at least three different types of servo field in a predetermined sequence, one type for every one or more contiguous information tracks,

said accessing apparatus including a movable portion of an optical head and direction detection means for detecting the moving direction of the movable portion from the sequence of changes in the type of servo field.

5,063,547
APPARATUS FOR AUTOMATICALLY REPRODUCING A USER-DEFINED PREFERRED SELECTION FROM A RECORD CARRIER

Pieter H. Custers, Eindhoven, Netherlands, and Ludo M. J. Stulens, Hasselt, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 221,685, Jul. 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 745,558, Jun. 17, 1985, Pat. No. 4,779,252. This application Jul. 20, 1990, Ser. No. 559,444
Claims priority, application Netherlands, Jul. 2, 1984, 8402095; Oct. 21, 1987, 8703086
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—32 **3 Claims**



1. An apparatus for reading information stored on a record carrier, comprising: reading means for reading the record carrier, means for controlling the read means, identification

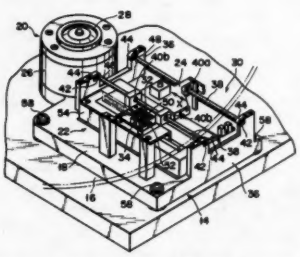
means for detecting a record-carrier identification of a record carrier before it is played, storage means for storing the record carrier identifications together with the corresponding preferred-selection programs for a plurality of record carriers, selection means responsive to the detected record carrier identification to select or not to select a preferred-selection program stored in the storage means, and means for setting the control means in such a way that parts of the information are read in the sequence defined by the selected preferred-selection program, characterized in that the apparatus comprises means for entering a user identification, the storage means being adapted to store, for at least one specific record-carrier identification, a plurality of preferred-selection programs associated with different user identifications in such a manner as to define the relationship between the user identification and the associated preferred-selection program, the selection means being adapted to detect whether for the combination of the detected record-carrier identification and the entered user identification a preferred-selection program is stored in the storage means and to select said preferred program if the presence of such a program is detected.

5,063,548

INFORMATION PROCESSING APPARATUS

Hiroshi Yamashita, Kawasaki, and Akihiko Doi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 3, 1989, Ser. No. 346,776
Claims priority, application Japan, May 13, 1988, 63-116713
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.14 **3 Claims**



1. An apparatus for processing information on an optical disk, comprising:

a first base;

optical head means for directing a light beam onto the optical disk and receiving the light beam reflected from the disk to generate an information signal;

means for supporting the optical head means to be movable in the radial direction of the optical disk, said supporting means including guide shafts, bearing means on the optical head means for slidably engaging said guide shafts, and support members on the base to support the ends of the guide shafts;

first insulating means for electrically insulating the optical head means from the base to prevent external noise from being transmitted to the optical head means through the base, said first insulating means being arranged between the ends of the guide shafts and the corresponding support members;

a second base on which said first base is secured by a plurality of fixing members passing through the first base and screwed into the second base; and

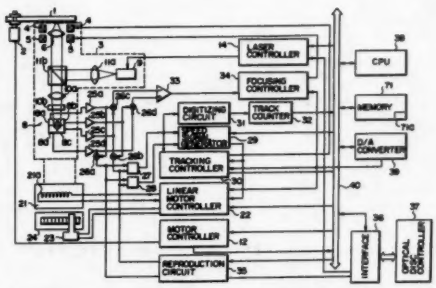
second insulating means for electrically insulating the base from the main base to prevent external noise from being transmitted from the second base to the first base, said second insulating means includes first insulating members interposed between the first base and the second base, and second insulating members interposed between the fixing members and the first base.

5,063,549

OPTICAL DISK APPARATUS

Mikio Yamamuro, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 26, 1989, Ser. No. 371,052
Claims priority, application Japan, Jun. 30, 1988, 63-163971
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.28 **9 Claims**



1. An optical disk apparatus comprising:

focus means for focusing a laser beam onto an optical disk having tracks thereon;

laser beam detecting means for detecting a laser beam reflected from said tracks of said optical disk and generating a detection signal;

moving means for moving said focusing means in a direction orthogonal to the axis of the laser beam;

tracking error signal generating means for generating a tracking error signal in accordance with the detection signal generated by said detecting means;

driving means responding to the tracking error signal to generate a signal used by said moving means to move said focusing means so that the laser beam traces a target track on said optical disk;

differentiating means for differentiating the tracking error signal from said tracking error generating means;

timing signal generating means for generating a timing signal in accordance with a position of the laser beam crossing the tracks;

means for sampling and holding the differentiated signal from said differentiating means in response to the timing signal from said timing signal generating means, and outputting a signal representative of the relative speed of said optical disk and said focusing means;

processing means for calculating a position difference signal corresponding to the position difference between a target track and the track where said laser beam is currently applied;

memory means for storing various speed control data corresponding to then number of tracks to be crossed by said laser beam to place the laser beam at the target track and outputting a predetermined speed control data in response to the position difference signal; and

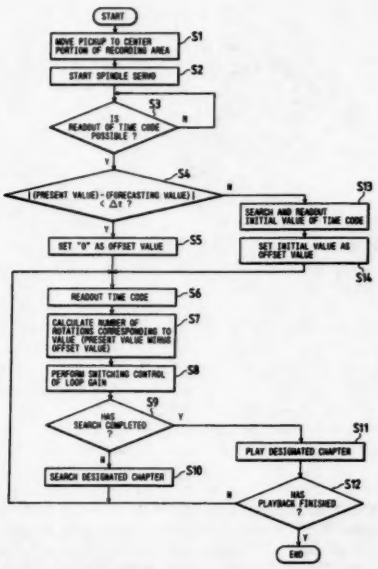
means for deenergizing said driving means when said processing means is energized and driving said moving means to move said focusing means and access the target track with said laser beam in response to a laser beam movement signal, a speed control data signal, the signal output from said sampling and holding means and the speed control data output from said memory means.

5,063,550

LOOP-GAIN CONTROL SYSTEM IN A SPINDLE SERVO LOOP

Haruo Watari, and Sigeru Yasuda, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 417,161
Claims priority, application Japan, Oct. 12, 1988, 63-256431
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.36 **5 Claims**



1. In a spindle servo loop of disc playback system for playing back discs having recorded thereon time codes representing addresses, said system and said loop being of the type having a pickup head for reading data from said disc, pickup head moving means for moving said pickup head radially of said disc, address means for developing an address corresponding to said data read by said pickup head, processor means responsive to input control signals and address signals for controlling movement of said pickup head and for providing gain control signals to control gain of an equalizer in said spindle servo loop to control the gain of amplification of a loop error signal, the improvement comprising, under control of said processor, the steps of:

(a) moving said pickup head radially to a predetermined start position of said disc and turning on said spindle servo and reading a predetermined start position address from said disc;

(b) comparing said predetermined start position address with a calculated value representing an expected start position address to determine if said addresses differ by a predetermined distance by determining a difference between said address;

(c) setting as a start offset value a predetermined value if said difference is within said predetermined distance, and setting as a start offset value said difference if said difference is outside said predetermined distance; and

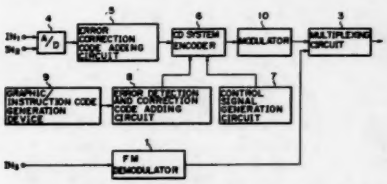
(d) controlling said spindle servo loop during search and playback operations and the gain of said equalizer in accordance with a second difference produced by subtracting said start offset value produced by said setting step from continuously read address data from said disc.

5,063,551

METHOD AND APPARATUS OF RECORDING AND REPRODUCING PICTURE INFORMATION AND RECORDING MEDIUM

Junichi Yoshio; Sumio Hosaka; Hisao Matsuoka; Youichirou Tsuda; Shoichi Katagiri, all of Tokorozawa, and Satoru Nomura, Yamanashi, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo and Pioneer Video Corporation, Yamanashi, both of, Japan

Filed Jan. 31, 1989, Ser. No. 304,282
Claims priority, application Japan, Apr. 25, 1988, 63-102175
Int. Cl.[5] H04N *5/93*
U.S. Cl. 369—48 **10 Claims**



1. A method of recording and reproducing information comprising the steps of;

inserting graphic codes including picture information, character codes, and an identification codes as a subcode to a digital audio signal to form a coded information signal, wherein said identification code indicates the coding system of said character codes;

recording said coded information signal on said recording medium; and

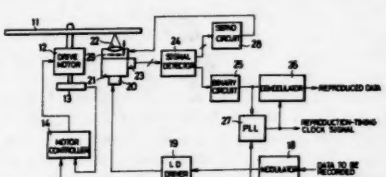
reproducing, at the time of playback of said recording medium, said picture information from said graphic codes and characters from said character codes in accordance with the coding system determined by said identification code.

5,063,552

OPTICAL DISK APPARATUS WITH DATA TRANSFER RATE AND ROTATIONAL SPEED VARIABLE BY ANNULAR ZONES

Toshihiro Shigemori, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,573
Claims priority, application Japan, Jul. 6, 1988, 63-168135
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—50 **16 Claims**



1. A method for controlling an information recording and/or reproduction speed "f" and a rotation speed "n" of an optical disk used in an information recording and/or reproduction device, said optical disk having a plurality of tracks in the form of concentric circles or a spiral, said information recording and/or reproduction device being adapted to access said tracks by means of a light beam while rotating said optical disk, thereby to optically record information on or reproduce information from said tracks, said method comprising the steps of:

dividing said tracks into a plurality of concentric annular blocks which are different in radius from each other;

changing said information recording and/or reproduction speed "f" in accordance with the radius of a track to be accessed in such a manner that said recording and/or reproduction speed "f" is constant within a block but different as between said blocks depending on the block radii; and

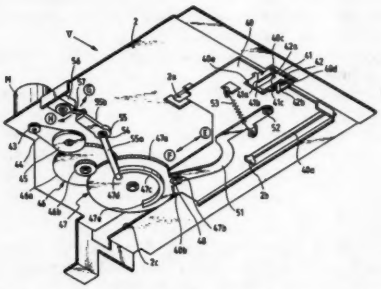
changing said rotation speed "n" of said optical disk in such a manner that f/(n·r) is constant, where "r" is the radius of said track to be accessed.

5,063,553

CARTRIDGE GUIDING DEVICE FOR DISK PLAYER

Shoji Suzuki, and Kenji Yatsu, both of Iwaki, Japan, assignors to Alpine Electronics Inc., Tokyo, Japan

Filed Aug. 16, 1990, Ser. No. 568,570
Claims priority, application Japan, Oct. 4, 1989, 1-260550
Int. Cl.[5] G11B *33/02, 17/22*
U.S. Cl. 369—77.1 **4 Claims**



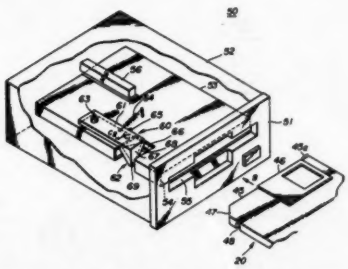
1. A cartridge guiding device for a disk player which includes a mounting section onto which a disk cartridge in which a plurality of disks are accommodated is to be mounted, and a disk driving section for driving a disk selectively taken out of a disk cartridge mounted on said mounting section, comprising a drawing-in member provided in mounting section such that said drawing-in member is driven by a motor to move toward the interior of said mounting section and is engaged, during such movement, with a stepped portion of a disk cartridge mounted on said mounting section to draw in the disk cartridge toward the interior of said mounting section, and a discharging member provided in said mounting section such that said discharging member is driven by said motor to move toward the outside of said mounting section and is engaged, during such movement, with part of a disk cartridge mounted on said mounting section to discharge the disk cartridge from said mounting section, wherein said mounting section has a cutout corresponding to a locus of movement of said drawing-in member and includes a restraining member provided thereon, and said drawing-in member is normally urged toward the interior of said mounting section by a spring such that, when a disk cartridge is mounted onto said mounting section, said drawing-in member is moved into said mounting section by way of said cut out of said mounting section by the urging force of said spring, but when no disk cartridge is mounted on said mounting section, said restraining member of said mounting section engages with said drawing-in member to restrain movement of said drawing in member by the urging force of said spring.

5,063,554

MAGNETO-OPTIC DISK UNIT HAVING MEANS FOR PREVENTING ERRONEOUS INSERTION OF DISK CARTRIDGE

Keiji Uehara, Iruma, Japan, assignor to TEAC Corporation, Japan

Filed Jan. 22, 1990, Ser. No. 467,927
Claims priority, application Japan, Jan. 24, 1989, 1-6568
Int. Cl.[5] G11B *33/00, 33/06*
U.S. Cl. 369—77.2 **10 Claims**



1. A magneto-optic disk unit for playing a magneto-optic disk which is accommodated within a magneto-optic disk cartridge, said magneto-optic disk cartridge having a generally rectangular shape with a front edge, first and second surfaces confronting respective data recording surfaces of the magneto-optic disk, first and second sides, a sloping portion formed in the front edge adjacent said first side of the magneto-optic disk cartridge and a depression formed in the second surface along said second side of the magneto-optic disk cartridge, said magneto-optic disk cartridge having a size and structure similar to those of a magnetic disk cartridge which accommodates a magnetic disk and has a thickness t2 which is smaller than a thickness t1 of said magneto-optic disk cartridge, said magnetic disk cartridge having a generally rectangular shape with a front edge, first and second surfaces confronting respective data recording surfaces of the magnetic disk, first and second sides, and a depression formed in the second surface along said second side of the magnetic disk cartridge, said magneto-optic disk unit comprising:

a casing (**52**) having an opening through which a disk cartridge is inserted into and extracted from said casing;

a cartridge holder (**53**) having an inserting opening for receiving the disk cartridge which is inserted through the opening of said casing; and

an erroneous insertion preventing mechanism (**60**) which is provided on said cartridge holder, said erroneous insertion preventing mechanism comprising a single erroneous insertion preventing element (**62**) which is provided in an inserting path of the disk cartridge and confronts the sloping surface of a magneto-optic disk cartridge inserted through the opening of said casing in a first orientation for permitting the insertion of a magneto-optic disk cartridge to a predetermined position within said cartridge holder when the magneto-optic disk cartridge is inserted in said first orientation,

said erroneous insertion preventing element (**62**) being pivotally provided on said cartridge holder and having a sloping portion (**68**) which cooperates with the sloping portion of a magneto-optic disk cartridge and urging means (**64**) for urging said erroneous insertion preventing element in a predetermined direction (**C1**) with an urging force, said sloping portion of said erroneous insertion preventing element being pushed by the sloping portion of a magneto-optic disk cartridge inserted in said first orientation so that said erroneous insertion preventing part is removed from the inserting path of the magneto-optic disk cartridge against the urging force of said urging means in a direction (**C2**) opposite to said predetermined direction,

said erroneous insertion preventing element (62) engaging one of the front edge adjacent the second side and the first depression of a magneto-optic disk cartridge inserted through the opening of said casing in a second orientation and prohibiting the insertion of the magneto-optic disk cartridge to said predetermined position within said cartridge holder when the magneto-optic disk cartridge is inserted in said second orientation.

5,063,555

ROTARY OPTICAL HEAD

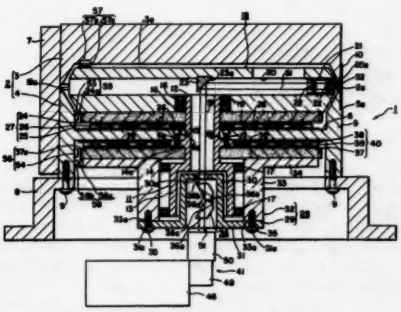
Hiroshi Miyoshi, Tokyo; Yoshiteru Kamatani, Kanagawa; Tadashi Ozue, Kanagawa; Tatsuya Narahara, Kanagawa, and Kiyoshi Ohsato, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 26, 1990, Ser. No. 618,116

Claims priority, application Japan, Nov. 27, 1989, 1-306866

Int. Cl.[5] G11B *3/74, 7/00*

U.S. Cl. 369—97 **9 Claims**



1. A rotary optical head apparatus comprising:

objective lens means;

beam generating means for generating a beam for propagation to said objective lens means along a beam path;

first rotary means mounting said objective lens means;

image rotator means;

second rotary means mounting said image rotator means in said beam path;

support shaft means for commonly supporting said first and second rotary means for rotation about a common axis;

first driving means for rotating said first rotary means together with said objective lens means about said axis at a given rotational speed; and

second driving means for rotating said second rotary means together with said image rotator means about said axis at a speed equal to one-half said given rotational speed.

5,063,556

OPTICAL INFORMATION RECORDING MEDIUM PROVIDING REFLECTED LIGHT AT TWO DIFFERENT WAVELENGTHS, RECORDING APPARATUS UTILIZING THE SAME

Kiyofumi Chikuma, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 327,884, Mar. 23, 1989, Pat. No. 4,927,681. This application Mar. 7, 1990, Ser. No. 489,636

Claims priority, application Japan, Aug. 12, 1988, 63-202542

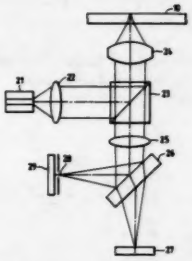
Int. Cl.[5] G11B *7/00, 7/24*

U.S. Cl. 369—112 **5 Claims**

1. An apparatus for reproducing optical information from a recording medium having a transparent substrate means, a reflective layer means for providing a first reflected light at a first wavelength based on a scanning light and island means disposed between the substrate means and the reflective layer means for providing a second reflected light at a wavelength different from that of the first reflected light, the island means being disposed in an array, said apparatus comprising:

illuminating optical system means for producing a small spot of said scanning light for scanning said array of said recording medium;

separating optical system means for separating an overall reflected light from said recording medium into said first reflected light corresponding to reflected said scanning light, and said second reflected light corresponding to light emitted from a light-emitting material of said island means;



first light-receiving means for receiving said first reflected light;

second light-receiving means for receiving said second reflected light; wherein

said reproducing apparatus generates a focus error signal on a basis of an output of said first light-receiving means, and generates a signal corresponding to recorded information on a basis of an output of said second light-receiving means and generates a tracking error signal in response thereto.

5,063,557

DISC DRIVE APPARATUS

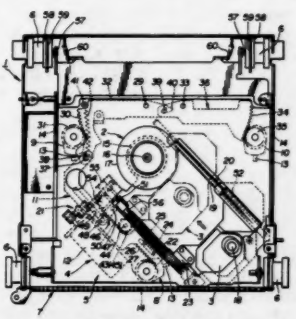
Ryoji Takamatsu, Kanagawa; Osamu Naitou, Tokyo; Hiroyuki Urushibata, Kanagawa, and Masahiro Sato, Iwate, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 12, 1989, Ser. No. 364,122

Claims priority, application Japan, Jun. 21, 1988, 63-152659

Int. Cl.[5] G11B *17/30*

U.S. Cl. 369—219 **17 Claims**



1. A disc drive apparatus comprising:

a base plate, with which means for rotatingly driving a disc is provided;

a stationary frame supporting said base plate through a vibration damping means;

a head for transferring information between said disc and said head;

means for driving said head along a radial direction of said

disc driven by said disc driving means, said head driving means including a motor for driving said head; and

locking means movable between a locking position for restricting movement of said base plate relative to said stationary frame and an unlocking position for permitting movement of said base plate relative to said stationary frame, said locking means mechanically cooperating with said head driving means to be operated between said locking position and said unlocking position by said motor of said head driving means.

5,063,558

DISK CARTRIDGE

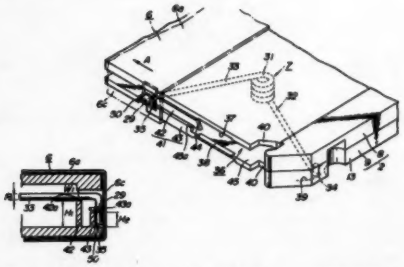
Kenji Takahashi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 30, 1990, Ser. No. 530,317

Claims priority, application Japan, Jun. 5, 1989, 1-142562

Int. Cl.[5] G11B *23/02, 23/03*

U.S. Cl. 369—291 **5 Claims**



1. In a disk cartridge which includes a cartridge body, a record disk rotatable in said cartridge body and having a signal recording area and a central chucking area, openings in the cartridge body through which said signal recording area and chucking area of said record disk may be exposed, a shutter slidably mounted on said cartridge body for movement across a front of the latter between opened and closed positions in which said openings in the cartridge body are uncovered and covered, respectively, and a torsion spring of resilient wire shaped to form a coil from which angularly movable first and second arms extend to bent ends acting against the cartridge body and the shutter, respectively, for biasing the shutter to said closed position; said cartridge body includes means defining a first spring retainer in a corner at the front of said body, a slot-like opening extending along said front of the body from said corner and through which said bent end of the first spring arm is engageable with said first spring retainer in the body, said slot-like opening including a relatively wide portion adjacent said corner and through which said torsion spring is bodily insertable into said body with said spring arms flexed toward each other after engagement of said bent end with said first spring retainer, a second spring retainer extending from said shutter into said slot-like opening, an outer rib extending along said slot-like opening from said relatively wide portion thereof and reaching substantially to a path of movement of said second spring retainer with said shutter and presenting an outer face directed forwardly, and an inner rib extending parallel to said outer rib and spaced inwardly therefrom to clear said second spring retainer and having an edge surface higher than said outer rib for narrowing the respective portion of the slot-like opening to a dimension only slightly greater than the diameter of said resilient wire, so that, when said spring arms are released after the bodily insertion of the torsion spring into the cartridge body, said spring arms move resiliently apart for causing said bent end of the second spring arm to move slidably along said outer face and into secure engagement with said second spring retainer while said second spring arm moves through the narrowed portion of said slot-like opening for preventing disengagement of the bent end of said second spring arm from said outer face of the outer rib.

5,063,559

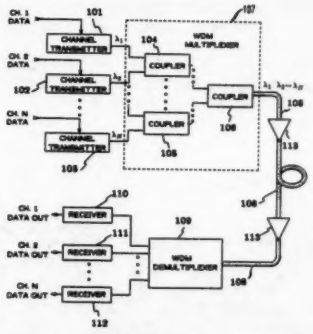
OPTIMIZED WAVELENGTH-DIVISION-MULTIPLEXED LIGHTWAVE COMMUNICATION SYSTEM

Dietrich Marcuse, Lincroft, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 28, 1990, Ser. No. 486,490

Int. Cl.[5] H04J *1/00*; H04B *10/00*

U.S. Cl. 359—127 **10 Claims**



1. Transmitter apparatus for generating lightwave signals to be wavelength-division-multiplexed in an optical fiber having a mean zero dispersion wavelength associated therewith, said transmitter apparatus comprising at least first and second channel transmitters, each transmitter including a light source and a modulating means optically coupled together, each said light source for generating a lightwave signal substantially at a carrier wavelength, said carrier wavelength for said first channel transmitter being at least 0.4 nm below said zero dispersion wavelength, a difference between said carrier wavelengths for said at least first and second channel transmitters being both greater than or equal to 2 nm and less than or equal to 3 nm.

5,063,560

SPREAD-SPECTRUM MULTIPLEXED TRANSMISSION SYSTEM

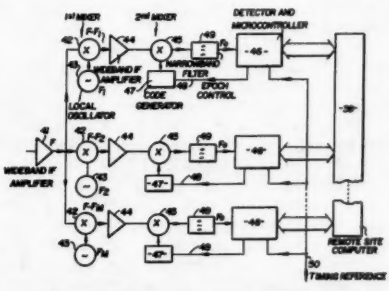
Michael J. Yerbury, St. Ives, and Gregory C. Hurst, Glebe, both of Australia, assignors to Advanced Systems Research Pty. Limited, Pymble, Australia

PCT No. PCT/AU87/00020, § 371 Date Aug. 4, 1988, § 102(e) Date Aug. 4, 1988, PCT Pub. No. WO87/04883, PCT Pub. Date Aug. 13, 1987

PCT Filed Jan. 27, 1987, Ser. No. 265,858

Int. Cl.[5] H04J *13/00*; H04L *27/30*

U.S. Cl. 370—18 **46 Claims**



1. A multi-channel spread-spectrum transmission system,

wherein a plurality of spread-spectrum signals are frequency division multiplexed to provide multiple transmission channels, comprising:

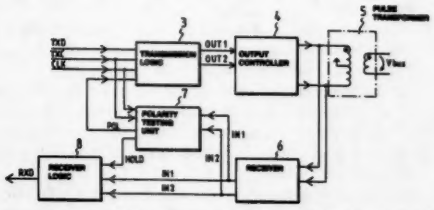
a plurality of transmitters each for transmitting a signal having a plurality of spaced spectral lines or bands produced by modulating a carrier with a pseudo-noise code, such that the transmitted signal of each channel has an information bandwidth which is significantly less than its spectral line or band spacing and the spread-spectrum signals each have centre frequencies which are spaced, respectively, by frequency increments selected to cause the spectral lines or bands of the respective transmitted signals to be interleaved, the selected frequency increments being less than the transmitter bandwidth of each signal.

5,063,561

PROCEDURE AND APPARATUS FOR TRANSMITTING BINARY MESSAGES IN A SERIAL COMMUNICATION BUS

Selin Kimmo, Hyvinkaa, Finland, assignor to Kone Elevator GmbH, Switzerland

Filed Sep. 27, 1989, Ser. No. 413,523
Claims priority, application Finland, Sep. 30, 1988, 884500
Int. Cl.[5] H04L *12/28*
U.S. Cl. 370—85.2 **11 Claims**



1. A procedure for transmitting binary signals on a serial communication bus, several transmitting stations being connected to said bus and each station monitoring signals present on the bus, wherein:

when the bus is free, any station may transmit an output signal; and

in a signal collision situation, when several transmitting stations attempt to transmit simultaneously an output signal, a station which has the highest priority is allowed to transmit, while any station having a lower priority, which when transmitting said output signal of a logic state assigned a recessive status receives an input signal of a logic state assigned a dominating status, will cancel its transmission attempt;

wherein the polarity of said input signal is detected by each station connected to the bus and the same detected polarity is assumed by each station when transmitting said output signal.

5,063,562

FLOW CONTROL FOR HIGH SPEED NETWORKS

Tsipora P. Barzilai, Millwood; Mon-Song Chen, Katonah; Bharath K. Kadaba, Peekskill, and Marc A. Kaplan, Purdys, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1990, Ser. No. 527,609
Int. Cl.[5] H04J *3/24, 3/16*
U.S. Cl. 370—94.1 **15 Claims**

1. In a packet transmission network, a method of adjusting the window size in a session between a sender and a receiver on a link of said network, said method comprising:

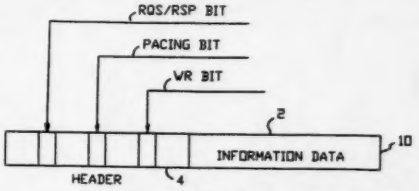
transmitting a pacing response to said sender indicating the size of a subsequent window to be transmitted in a session between said sender and said receiver, said size of said subsequent window being a number of packets that said sender can transmit in a subsequent window,

said subsequent window size (WS) being determined by decreasing a previous window size if when said window size is to be calculated, either QL≠0, or QL=0 and a pacing request was not received within a specified time interval, said window size thus being determined according to the following formula:

$$WS = max(W_{min}, CNT - QL + B),$$

where CNT is the number of packets received by said receiver from said sender during a round trip delay which is the time needed for a first packet to be transmitted from said sender to said receiver plus the time needed for a second packet to be transmitted from said receiver to said sender after said first packet is received by said receiver, where QL is the number of packets stored in a queue of said receiver for future transmission to another node of said network, where W_{min} is a prespecified parameter denoting a minimum window size, and where B is also a prespecified parameter,

said subsequent window size being determined by increasing a previous window size if when said subsequent window size is to be calculated, QL=0 and a pacing request was received in said specified time interval, said subsequent window size thus assuming a value between CNT and W_{max}, where W_{max} is a prespecified parameter.

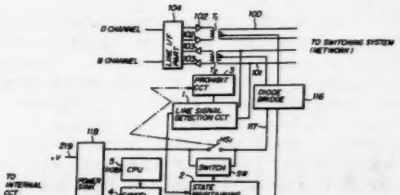


5,063,563

COMMUNICATION TERMINAL HAVING MEANS FOR CONTROLLING POWER TRANSFER

Koji Ikeda, Kawasaka, and Mikio Nakayama, Tokyo, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 6, 1990, Ser. No. 578,358
Claims priority, application Japan, Sep. 14, 1989, 1-238722
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—110.1 **31 Claims**



1. A communication terminal which is coupled to a communication network via transmitting and receiving signal lines and a switching system, said communication terminal comprising:

a power input line coupled to the transmitting and receiving signal lines;

a power sink for supplying power;

switching means coupled between said power input line and said power sink;

a hook switch coupled between said power input line and said power sink in parallel to said switching means;

detection circuit means coupled to the receiving signal line for detecting a signal on the receiving signal line;

state maintaining circuit means coupled to said switching means and said detection circuit means for closing said switching means and for maintaining said switching means in a closed state by carrying out a state maintaining operation when a signal is detected by said detection circuit means; and

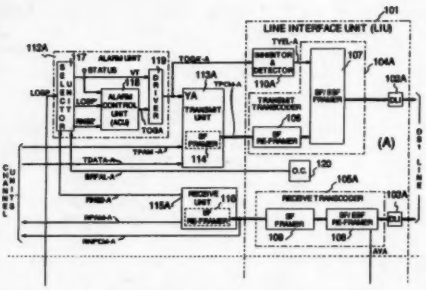
prohibit circuit means coupled to said detection circuit means for prohibiting a signal detection of said detection circuit means.

5,063,564

YELLOW ALARM CONTROL IN DS1 SF AND DS1 ESF TRANSCODING

John H. Crandall, Newton, N.H.; Stephen J. Davis, Methuen, and Brett S. Reynolds, Salisbury, both of Mass., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 9, 1990, Ser. No. 491,368
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—110.1 **16 Claims**



1. A digital line interface unit for interfacing a digital channel bank to at least one DS1 digital transmission line comprising:

at least a first transmit transcoder including means for formatting channel signals into a DS1 Super Frame format having a predetermined number of time slots in a frame and a predetermined number of frames in a Super Frame, means for formatting channel signals into a DS1 Extended Super Frame format signal including a data link, means for inserting prescribed yellow alarm information into said data link of a DS1 Extended Super Frame signal being formatted and means for inserting prescribed yellow alarm information in a predetermined bit position of time slots of a DS1 Super Frame signal being formatted; and

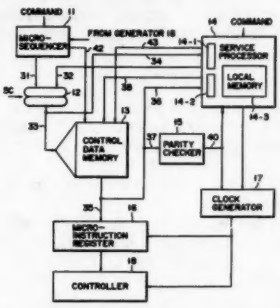
means for originating a first control signal to inhibit insertion of said prescribed yellow alarm information into said predetermined bit position of time slots of the DS1 Super Frame formatted signal when said at least first transmit transcoder is set to supply the DS1 Extended Super Frame signal being formatted as an output to said at least one DS1 digital transmission line.

5,063,565

SINGLE-ERROR DETECTING AND CORRECTING SYSTEM

Takayoshi Ohashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 289,126, Dec. 23, 1988, abandoned.
This application Apr. 23, 1991, Ser. No. 688,718
Claims priority, application Japan, Dec. 28, 1987, 62-334719
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—40.2 **12 Claims**



1. A system for detecting and correcting single-bit error, comprising:

first storage means for storing data and outputting the data in response to an input address in a read mode, the data comprising control data and check data;

error detecting means for checking in accordance with the check data whether the control data in the data read from said first storage means contains an error and generating an error detect signal in accordance with the result of the error checking; and

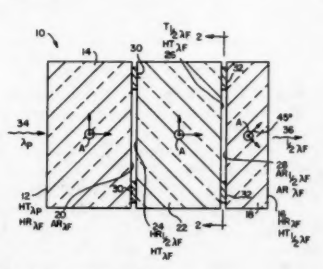
correcting means, responsive to the error detect signal from said error detecting means and having second storage means for storing a single error correction-double error detection (SEC-DED) code, for correction the data from said first storage means in accordance with the SEC-DED code, setting said first storage means to a write mode and writing corrected data into said first storage means.

5,063,566

INTERNALLY-DOUBLED, COMPOSITE-CAVITY MICROLASER

George J. Dixon, Orlando, Fla., assignor to Amoco Corporation, Chicago, Ill.

Filed Apr. 30, 1990, Ser. No. 516,459
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—22 **22 Claims**



2. A microlaser, comprising:

a. a gain medium having one face which is adapted to be close coupled to a source of optical pumping radiation and which is highly reflective to laser light at a fundamental

wavelength and having an opposite face for high transmission of laser light at said fundamental wavelength;

b. harmonic conversion means having a close face which is located adjacent to said opposite face of said gain medium and which has high transmission at said fundamental wavelength and high reflectivity at a harmonic of said fundamental wavelength, and having an opposite parallel face which has high transmission at said fundamental wavelength and some transmission at said harmonic;

c. control means, located adjacent to said opposite face of said harmonic conversion means, for adjusting the phase of said fundamental wavelength to maximize harmonic conversion, for emitting optical radiation at said harmonic, and for reflecting laser light at said fundamental frequency; and.

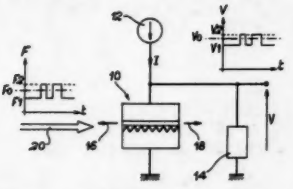
d. coated spacer rail means, carried by at least one of said faces of said harmonic conversion means and said gain medium, for separating said harmonic conversion means from said gain medium, wherein said coated spacer rail means comprises at least one strip of evaporated Al_2O_3 for separating said harmonic conversion means from said gain medium.

5,063,567

PHOTORECEPTOR FOR FREQUENCY-MODULATED OPTICAL SIGNALS

Hisao Nakajima, Paris, France, assignor to L'Etat Francais represente par le Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications), Issy les Moulineaux, France

Filed Sep. 14, 1990, Ser. No. 582,157
Claims priority, application France, Sep. 27, 1989, 89 12646
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—28 **9 Claims**



1. A photoreceptor for frequency modulated optical signals, comprising:

a semiconductor laser having an active layer, a threshold current level, a natural operating frequency, a polarization current source, feeding laser current from at least one first terminal through said semiconductor laser to at least one second terminal, wherein said laser current is at least twice said threshold current level, said semiconductor laser being in an oscillating state;

means for injecting a frequency modulated optical beam having an injection lock frequency into said active layer; thereby injection locking said semiconductor laser at said injection lock frequency;

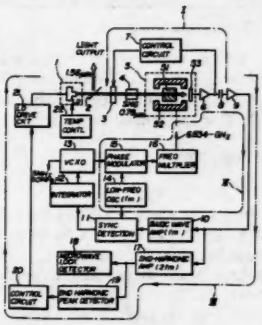
voltage measuring means for measuring voltage variations between said first terminals and said second terminals; wherein said voltage variation is linearly proportional to the difference between said injection lock frequency and said natural frequency over the range of frequency that said semiconductor laser is injection locked to said frequency modulated optical beam.

5,063,568

WAVELENGTH STABILIZED LIGHT SOURCE

Kazuharu Chiba, Yokohama; Yoshifumi Nakajima, and Hideo Sumiyoshi, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP89/00899, § 371 Date May 4, 1990, § 102(e) Date May 4, 1990, PCT Pub. No. WO90/03054, PCT Pub. Date Mar. 22, 1990
PCT Filed Aug. 1, 1989, Ser. No. 474,098
Claims priority, application Japan, Sep. 5, 1988, 63-221816
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—32 **20 Claims**



1. A wavelength stabilized light source comprising:

laser beam emitting means for emitting a laser beam provided as an output light of said light source;

harmonic generating means for generating a harmonic light of a frequency which is n times (n is an integer equal to or larger than 2) the frequency of said laser beam;

resonator means having a resonance cell including a resonance substance, for generating a double resonance in said resonance cell by irradiating said harmonic light supplied from said harmonic generating means onto said resonance substance and by irradiating a microwave having an alternating component onto said resonance cell, and for generating a double resonance signal based on said double resonance;

microwave controlling means, coupled to said resonator means, for controlling said microwave to be irradiated onto said resonance cell so that the frequency of said microwave is equal to a predetermined microwave resonance frequency based on said double resonance signal supplied from said resonator means; and

laser beam wavelength controlling means, coupled to said resonator means and said laser beam emitting means, for controlling said laser beam emitting means so that the wavelength of said harmonic light generated by said harmonic generating means is equal to a resonance wavelength of said resonance substance provided in said resonance cell based on said double resonance signal.

5,063,569

VERTICAL-CAVITY SURFACE-EMITTING LASER WITH NON-EPITAXIAL MULTILAYERED DIELECTRIC REFLECTORS LOCATED ON BOTH SURFACES

Ya-Hong Xie, Flemington, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

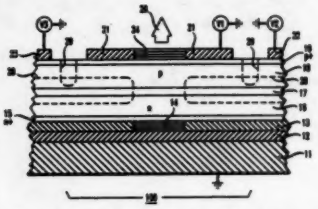
Filed Dec. 19, 1990, Ser. No. 630,464
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **12 Claims**

1. In a vertical-cavity semiconductor laser structure:

(a) a first epitaxially grown semiconductor buffer layer having a planar top surface;

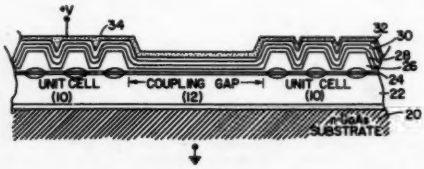
(b) a second epitaxially grown semiconductor buffer layer having a planar bottom surface;

(c) an epitaxially grown semiconductive active layer sandwiched between the first and second buffer layers;
(d) a first multilayered dielectric reflector located on the top surface of the first buffer layer; and



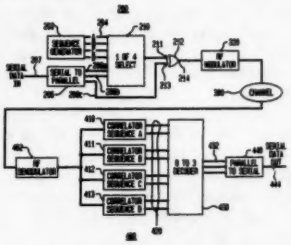
(e) a second multilayered dielectric reflector located on the bottom surface of the second buffer layer,
the first and second reflectors being non-epitaxial with respect to the first and second buffer layers, respectively.

5,063,570
SEMICONDUCTOR LASER ARRAYS USING LEAKY WAVE INTERARRAY COUPLING
Dan Botez, Redondo Beach; Luke J. Mawst, Torrance, and Gary L. Peterson, Long Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Oct. 29, 1990, Ser. No. 604,315
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 **8 Claims**



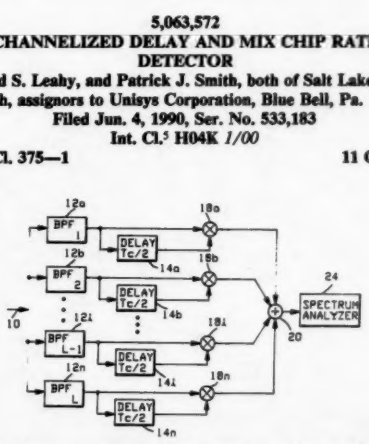
1. A semiconductor laser array structure, comprising:
means for producing lasing action in the structure, including a substrate, an active semiconductor layer and adjacent cladding layers successively formed on the substrate, at least two electrodes formed on opposite faces of the substrate, for applying a voltage across the active layer, and a pair of reflective facets, at least one of which is an emitting facet, formed at opposite ends of the array structure;
a plurality of negative-index waveguides with parallel longitudinal axes, the waveguides being arranged in a smaller number of array cells, which operate in or near a 0°-phase-shift-array-mode resonance condition in which there is strong coupling between all waveguides in each array cell and a high degree of array cell coherence; and
a plurality of interarray regions, each of which is wider than interelement spacings between the waveguides in each array cell, and separates adjacent array cells, wherein each interarray region has a lateral width chosen to produce a 0°-phase-shift-array-mode resonance condition in the entire device, in which there is strong coupling between the array cells, a high degree of device coherence among all of the array cells, and a virtually uniform near-field intensity profile;
and wherein the structure further includes in the interarray regions means for introducing losses, which inhibit operation in array modes other than the 0°-phase-shift mode, whereby high optical powers are achieved without adversely affecting array mode discrimination.

5,063,571
METHOD AND APPARATUS FOR INCREASING THE DATA RATE FOR A GIVEN SYMBOL RATE IN A SPREAD SPECTRUM SYSTEM
Jan P. Vancraeynest, White Plains, N.Y., assignor to NYNEX Corporation, White Plains, N.Y.
Filed Dec. 27, 1989, Ser. No. 457,276
Int. Cl.[5] H04L *27/30*
U.S. Cl. 375—1 **20 Claims**



8. A coding circuit for coding a stream of data bits in a spread spectrum format comprising,
selection means for simultaneously receiving a plurality of data bits from said data bit stream and for selecting a particular spreading sequence out of a plurality of predetermined spreading sequences as a function of the bit values in said plurality of data bits, and
transmitting means for transmitting said plurality of data bits as spread by said particular spreading sequence to a remote location.

5,063,572
CHANNELIZED DELAY AND MIX CHIP RATE DETECTOR
Ronald S. Leahy, and Patrick J. Smith, both of Salt Lake City, Utah, assignors to Unisys Corporation, Blue Bell, Pa.
Filed Jun. 4, 1990, Ser. No. 533,183
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 **11 Claims**



1. A chip rate detector for detection of the chip rate of coded bits of a direct sequence frequency hopped input signal comprising:
(a) channelizing means having sections for splitting said input signal for transmission into L separate sub-bands of frequency ranges;
(b) delay means, in each sub-band of said channelizing means for delaying said sub-band signal by a fixed constant to obtain a delayed sub-band signal;
(c) mixing means for multiplying said delayed sub-band signal with said sub-band signal to provide a sub-band product signal;
(d) summation means for totalizing the sum of each sub-band product signal to generate a final output chip rate signal.

5,063,573

METHOD FOR THE EQUALIZATION OF DISPERSIVE, LINEAR OR APPROXIMATELY LINEAR CHANNELS FOR THE TRANSMISSION OF DIGITAL SIGNALS AND ARRANGEMENT FOR CARRYING OUT THE METHOD

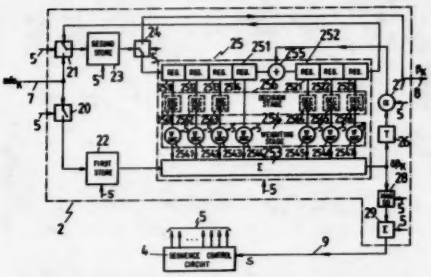
Ulrich Langewellpott, Thalfingen, Fed. Rep. of Germany, assignor to Licentia Patent Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Aug. 21, 1989, Ser. No. 408,509

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744075

Int. Cl.[5] H03H *21/00*

U.S. Cl. 375—14 20 Claims



1. A method for the equalization of dispersive, linear or approximately linear channels, particularly radio channels, for transmitting digital signals by means of an matched filter and a following equalizer, comprising the steps of:

providing a matched filter (1) which is matched to the entire transmission channel;

filtering, in the matched filter (1), a received signal r(t) characterized by a data sequence a_k to produce a time-discrete signal sequence mfo_k at the output of the matched filter (1), which automatically determines the optimum sampling times for the time-discrete signal sequence mfo_k; and

equalizing the time-discrete signal sequence mfo_k in sections in the equalizer (2) by means of an iteration procedure with relaxation, with said procedure comprising the steps of:

subdividing the signal sequence mfo_k into shorter mutually overlapping sections and storing the sections individually in a first and second store (22, 23) of the equalizer (2);

equalizing the shorter mutually overlapping sections of signal sequence mfo_k stored in each case in an equalization filter (25) of the equalizer (2);

feeding the data stored in the second store (23) to the input of a first shift register (251) which is connected in series with a second shift register (252);

feeding, in each clock interval of one iteration cycle, the data stored in the individual register locations (2511–2514; 2521–2523) of the first and second shift registers (251; 252) via weighting sections (2541–1547) of a weighting stage (254) to a summation section (253), where they are summed together;

feeding back the data $\delta\beta_k$ summed together at the output of the summation section (253) with a time delay and additional weighting (relaxation) to the input of the second shift register (252);

generating in the equalization filter (25), during each iteration cycle, new estimated values β_k of the data sequence a_k which are in each case output at the output of the second shift register (252) and are subsequently stored in the second store (23) and during this process overwrite the data hitherto stored;

summing together in each iteration cycle the square of the magnitude formed from the processed data $\delta\beta_k$ at the output of the summation section (253) and the individual magnitude squares and using the sum signal s to determine the relaxation factor α for the processed data $\delta\beta_k$ fed back and as criterion for the termination of the iteration process; and

after termination of the iteration process, outputting the estimated values β_k, last stored in the second store (23), of the data sequence a_k at the output (8) of the equalizer (2) and subsequently storing the next section of the output signal sequence mfo_k of the matched filter (1) in the two stores (22, 23).

5,063,574

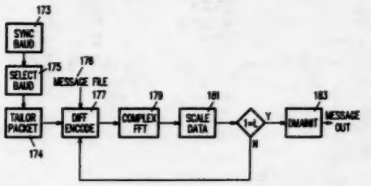
MULTI-FREQUENCY DIFFERENTIALLY ENCODED DIGITAL COMMUNICATION FOR HIGH DATA RATE TRANSMISSION THROUGH UNEQUALIZED CHANNELS

Paul H. Moose, P.O. Box 4181, Carmel, Calif. 93921

Filed Mar. 6, 1990, Ser. No. 490,769

Int. Cl.[5] H03M *7/00*; H04L *27/10*

U.S. Cl. 375—27 30 Claims



1. Apparatus for encoding a data signal on a plurality of carrier frequencies for transmission over a transmission channel, said apparatus comprising:

encoding means for differentially encoding a plurality of first digital words into a plurality of second digital words, each of said second digital words being a modulation value corresponding to one of said plurality of first digital words, each said modulation value being a predetermined function of said corresponding first digital word and a different one of said first digital words;

transform means coupled to said encoding means for transforming said plurality of modulation values into a digital signal representative of a plurality of predetermined digital carrier frequencies, each of said plurality of predetermined digital carrier frequencies modulated by a corresponding one of said plurality of modulation values; and

data transfer means coupled to said transform means for coupling said digital signal to a transmission channel and for converting said digital signal to an analog signal for transmission over a transmission channel, said analog signal being a sum of a plurality of modulated predetermined analog carrier frequencies corresponding to said plurality of predetermined digital carrier frequencies.

5,063,575

APPARATUS AND METHOD FOR PROPER BYTE ALIGNMENT IN AN ENCODER/DECODER

Kadiresan Annamalai, Milpitas, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 17, 1989, Ser. No. 339,722

Int. Cl.[5] H04L *5/24*

U.S. Cl. 375—108 12 Claims

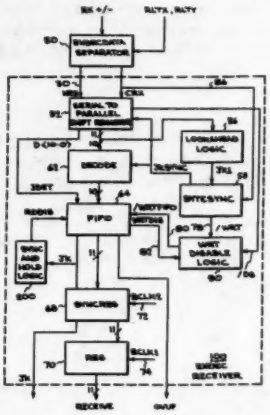
10. In an Encoder/Decoder (ENDEC) receiver in a node of a data communication network, an apparatus for ensuring that data received from other network nodes is accurately decoded without generating a fragment byte, said apparatus comprising:

first detecting means for detecting receipt of a first predetermined data signal from another network node;

second detecting means for detecting receipt of a second

predetermined data signal from said another network node; and

a logic circuit for controlling writing of received data within said receiver, wherein



said logic circuit disables writing of received data in response to the detection of said first predetermined data signal by said first detecting means, and

said logic circuit enables writing of received data in response to the detection of said second predetermined data signal by said second detecting means.

5,063,576

CODING AND DECODING METHOD FOR ASYNCHRONOUS DATA SIGNALS AND AN APPARATUS THEREFOR

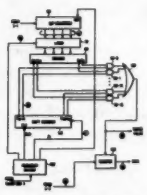
Mikiro Eguchi, and Hideto Sato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,020

Claims priority, application Japan, Dec. 28, 1988, 63-334301

Int. Cl.[5] H04L *7/04*

U.S. Cl. 375—111 **13 Claims**



11. A decoding method for a coded data signal sent with a phase difference signal which represents a phase difference associated with the coded data signal, said decoding method comprising the steps of:

decoding said phase difference signal to produce a decoded phase difference signal;

delaying a reference clock pulse signal having a predetermined frequency by a time representative of said decoded phase difference signal to produce a decoder timing signal; and

decoding said coded data signal to produce a decoded data signal, in response to said decoder timing signal.

5,063,577

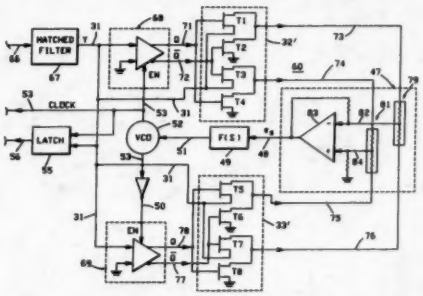
HIGH-SPEED BIT SYNCHRONIZER

Glenn A. Arbanas, Salt Lake City; Jeffery M. Thornock, Layton, both of Utah, and Christopher R. Keate, Chandler, Ariz., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 12, 1989, Ser. No. 449,683

Int. Cl.[5] H03D *3/24*

U.S. Cl. 375—120 **9 Claims**



1. A high-speed bit synchronizer circuit for generating a recovered clock and synchronized data from a data stream, comprising:

phase detector means coupled to an input data stream having zero crossing data,

said phase detector means being enabled by said recovered clock comprising a pair of recovered clock enabled comparators each having a real (Q) and an inverted ($\overline{Q}$) data output,

a pair of electronic switches coupled to said input data stream, and each one of said electronic switches being further coupled to the Q and $\overline{Q}$ data output of one of said associated pairs of comparators each having a positive and a negative output line,

a negative summing circuit having input terminals connected to the negative output lines of each of said pair of electronic switches to provide a summed negative output,

a positive summing circuit having input terminals connected to the positive output lines of each of said pair of electronic switches to provide a summed positive output,

a summing amplifier having a positive input coupled to said summed positive output of said positive summing circuit and a negative input coupled to said summed negative output of said negative summing circuit to provide an error signal output indicative of the phase difference between said input data stream and said recovered clock,

voltage controller oscillator (VCO) means having its input coupled to said error signal output from said summing amplifier for providing said recovered clock as an output, and

data recover means having inputs coupled to said input data stream and to said recovered clock signal to provide synchronized bit data as output signals.

5,063,578

DIGITAL LOGIC CIRCUITS FOR FREQUENCY MULTIPLICATION

Philip W. Diodato, Asbury, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 24, 1990, Ser. No. 586,659

Int. Cl.[5] H03K *21/08, 23/00*; H03B *19/00*

U.S. Cl. 377—47 **20 Claims**

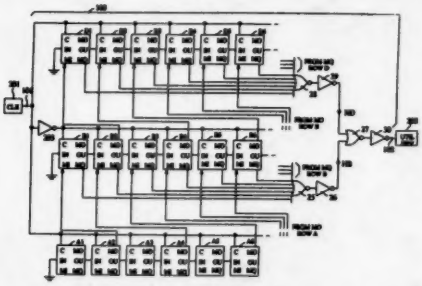
1. A frequency multiplier circuit comprising:

(a) a first cascaded chain (A1 A2 A3 . . .) of clocked delay elements (12, 13), each such delay element having an intermediate node (R) and an output terminal (OU), and

each having essentially the same time delay d in response to a change in an input applied thereto;

(b) a first set of clocked latches (14, 15, 16 in e.g., A2, A4, A6, . . .) the node (R) of the ni'th one of the clocked delay elements in the first chain (A1 A2 A3 . . .) being connected to an input terminal of the n'th one of the clocked latches (14, 15, 16 in e.g., A2, A4, A6, . . .) where n is a running integer and i is a fixed integer;

(c) a second cascaded chain (B1 B2 B3 . . .) of clocked delay elements (12, 13), each having an intermediate node (R) and an output terminal (OU) and having the same time delay d in response to a change in an input applied thereto;



(d) a first set of logic gates (11 in B1, B2, B3, . . .), the nk'th one of each having one input terminal (MI) thereof connected to an output terminal (MO) of the n'th one of the clocked latches in the first set of latches (14, 15, 16 in e.g., A2, A4, A6, . . .), and the n'th one of each having another input terminal connected to the output terminal (OU) of the (n−1)'th one of the clocked delay elements (12 and 13 in B1 B2 B3 . . .) in the second cascaded chain;

(e) a first multiple input logic gate (25); and

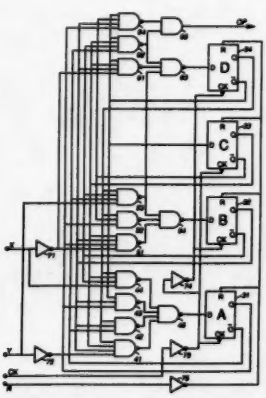
(f) means for connecting an output terminal of each of the logic gates (11) in the first set thereof to a separate one of the input terminals of the multiple input logic gate (25).

5,063,579

SCALER FOR SYNCHRONOUS DIGITAL CLOCK

Lawrence H. Sasaki, Manotick, and Sun-Shiu D. Chan, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 11, 1990, Ser. No. 524,398
Int. Cl.[5] H03K *21/38*
U.S. Cl. 377—48 **4 Claims**



1. A scaler having a selectively variable modulus, for receiving input clock pulses and generating a train of output pulses, the scaler comprising:

a first set of D-type flip-flops responsive only to rising edges of said input clock pulses;

a second set of D-type flip-flops responsive only to falling edges of said input clock pulses;

a plurality of gates interconnected between the outputs and D-inputs of the flip-flops to control said scaler's state; and

means for providing at least one control signal,

wherein said scaler's state transits, on each half cycle of said input clock pulses, along one of two state transition loops, each loop generating output pulses having identical repetition rates, the output pulses of one loop being shifted in phase relative to the other loop by an odd number of half cycles of said input clock pulses; and

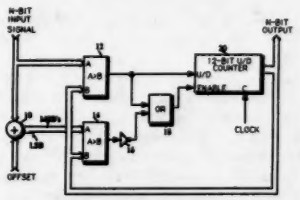
said scaler's state transits in response to said control signal, from one of said two loops to the other through at least one intermediate state, so as to generate at least one output pulse at an alternative repetition rate, which differs from said identical repetition rates by the odd number of half cycles of the input clock pulses.

5,063,580

APPARATUS FOR CONDITIONING A CONTROL SIGNAL

Barth A. Canfield, Indianapolis, Ind., and Russell T. Fling, Naperville, Ill., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 7, 1990, Ser. No. 520,204
Int. Cl.[5] H03K *21/02*
U.S. Cl. 377—55 **6 Claims**



1. Signal conditioning apparatus comprising:

an input terminal for receiving an input signal;

an output terminal for providing an output signal;

a source of offset signal;

means coupled to said input terminal and said source, for summing said offset signal and said input signal to provide an offset input signal;

means, responsive to said input and output signals, for providing a first signal having first and second states when said input signal is greater and lesser than said output signal respectively;

means, responsive to said offset input signal and said output signal, for providing a second signal having second and first states when said offset input signal is greater and lesser than said output signal respectively;

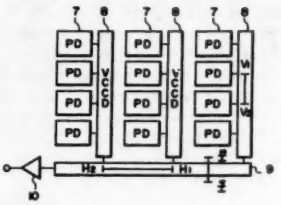
means for generating said output signal, including means for storing said output signal, and responsive to the state exhibited by said first signal, for incrementing or decrementing said output signal if either of said first and second signals exhibit a predetermined one of said first and second states.

5,063,581

SEMICONDUCTOR IMAGING DEVICE HAVING A PLURALITY OF PHOTODIODES AND CHARGE COUPLED DEVICES

Hajime Akimoto, Hachioji; Toshifumi Ozaki, Koganei; Kazuya Tokumasu, Kodaira; Hideyuki Ono, and Haruhiko Tanaka, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1990, Ser. No. 557,699
Claims priority, application Japan, Jul. 31, 1989, 1-196568
Int. Cl.[5] H01L *27/148*
U.S. Cl. 377—58 22 Claims



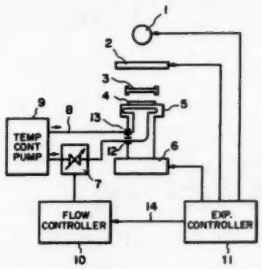
1. A semiconductor device, comprising:
a semiconductor substrate;
a plurality of photo liodes provided on said semiconductor substrate;
vertical charge coupled devices (CCDs) provided on said semiconductor substrate and transferring signal charges of said photodiodes; and
a horizontal charge coupled device (CCD) provided on said semiconductor substrate and transferring signal charges received from said vertical CCDs,
wherein said horizontal CCD includes:
a semiconductor region of a first conductivity type provided on said semiconductor substrate which is of a second conductivity type;
a semiconductor region of the second conductivity type, wherein a channel for charge transfer is formed, provided on said semiconductor region of the first conductivity type;
a plurality of electrodes formed on said semiconductor region of the second conductivity type through an insulating film;
first means for applying a predetermined voltage to said plurality of electrodes successively for transferring signal charges composed of a majority carrier in the semiconductor region of the second conductivity type in a depletion region formed under these electrodes; and
second means for applying between said semiconductor region of the first conductivity type and said semiconductor substrate a predetermined voltage so as to produce a depletion region at an interface between said semiconductor substrate and said semiconductor region of the first conductivity type,
the depletion region formed under said electrodes and the depletion region provided at the interface between said semiconductor region of the first conductivity type and said semiconductor substrate meet each other under each one of said plurality of electrodes to thereby enhance the electric field produced for charge transfer in a transfer direction, through the channel, of said signal charges in the depletion region of said semiconductor region of the second conductivity type under said plurality of electrodes, and
wherein said vertical CCDs, which respectively include a corresponding plurality of electrodes, are characterized such that in each one thereof there is produced a depletion region corresponding to the channel which is configured to not meet, under each one of the plurality of electrodes thereof, the depletion region produced at an interface between a corresponding semiconductor region of the first conductivity type and said semiconductor substrate, which interface underlies the channels of said vertical CCDs.

5,063,582

LIQUID COOLED X-RAY LITHOGRAPHIC EXPOSURE APPARATUS

Tetsuzo Mori, Atsugi; Eiji Sakamoto, Sagamihara; Shinichi Hara, Atsugi; Koji Uda, Yokohama; Isamu Shimoda, Zama; Shunichi Uzawa, Tokyo, and Kunitaka Ozawa, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 401,653, Aug. 31, 1989, abandoned.
This application Feb. 20, 1991, Ser. No. 658,434
Claims priority, application Japan, Sep. 2, 1988, 63-218520; May 30, 1989, 1-138809
Int. Cl.[5] G21K *5/00*; G03B *27/52*
U.S. Cl. 378—34 17 Claims



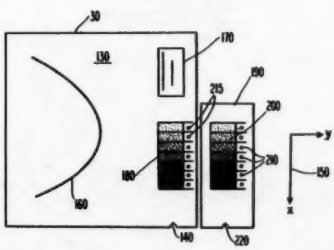
1. A lithographic exposure apparatus, comprising:
a chuck for supporting a member for exposure;
exposure means for exposing the member to exposure energy;
supply means for supplying a temperature controlling medium to said supporting chuck through a medium passage;
flow control means located in said passage; and
control means for controlling said flow control means to provide differing flow rates of the medium supplied to said chuck between a time when the member is exposed to the exposure energy and a time when the member is not exposed thereto, such that the flow rate is less when the member is being exposed than when the member is not being exposed.

5,063,583

METHOD AND APPARATUS FOR TESTING RADIOGRAPHIC FILM PROCESSORS

Benjamin M. Galkin, Cherry Hill, N.J., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed Nov. 24, 1989, Ser. No. 441,567
Int. Cl.[5] G01D *18/00*
U.S. Cl. 378—207 25 Claims



1. A method of determining performance of a film processor which develops a radiographic image of a structure of interest on a film having an emulsion, comprising the steps of:

shielding a first portion of the film along one edge of the film from x-ray energy used for imaging of the structure of interest, which edge is furthest from the structure of interest;

impressing a first calibrated test pattern on the first portion of the film, said first pattern comprising a first calibrated graded stepwise density pattern having density positions, said density pattern produced by visible light, and a first plurality of symbols, located adjacent said first calibrated graded density pattern, wherein each symbol indicates the magnitude of one of said density positions;

providing a control film of similar emulsion as the emulsion of said film;

impressing a second calibrated test pattern along one edge of said control film said second calibrated test pattern comprising a second calibrated graded stepwise density pattern having density positions, said density pattern produced by visible light, and a second plurality of symbols, located adjacent said second calibrated graded density pattern, wherein each symbol indicates the magnitude of one of said density positions, wherein the step of impressing said first calibrated test pattern and said second calibrated test pattern are identical;

processing the film in a film processor to develop the first calibrated test pattern on the first portion of the film and the radiographic image of the structure of interest on the second portion of the film;

processing said control film to develop the second calibrated test pattern; and

measuring the performance of the film processor used to develope the film by visually comparing and noting the symbols associated with those density positions between the first calibrated test pattern on the film and the second calibrated test pattern on the control film which match.

5,063,584

METHOD FOR TESTING SUBSCRIBER'S EQUIPMENT

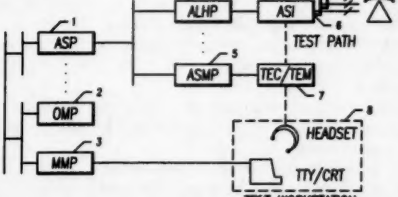
Jae S. Lee, Jungku Daejeon; Tae I. Kim, and Young S. Kim, both of Daeduckku Daejeon, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Seoul and Korea Telecommunications Authority, Yuseong-Ku Daejeon, both of, Rep. of Korea

Filed Jul. 6, 1990, Ser. No. 549,146

Claims priority, application Rep. of Korea, Jul. 8, 1989, 1989-9752

Int. Cl.[5] H04M *1/24, 3/24;* **H04B** *3/48*

U.S. Cl. 379—29 **3 Claims**



1. In an electronic exchanger comprising a testing board, a Man Machine Processor to control the input and the output of the testing board which performs interface functions with an operator, an Operation Management and Maintenance Processor, an Access Switching Processor to control a subscriber's equipment and a line, a test equipment for performing test of the subscriber's equipment, an Access Switching Management Processor for providing between the test equipment and the Access Switching Processor, an Analog Subscriber Interface Processor for processing an analog line, and an Analog Subscriber Interface Hardware Unit for making an interface with the subscriber, a method for testing the subscriber's equipment comprising steps for:

analyzing commands provided by the operator, and delivering the results to the Operation Management and Maintenance Processor;

delivering the commands to the Access Switching Processor and asking the Access Switching Maintenance Processor to interconnect the test equipment in case the execution of the test is verified to be possible after checking the status of the processors and the test equipment;

asking the Analog Subscriber Interface Hardware Unit to connect the subscriber's equipment in case the line is not on service after checking the subscriber's line, and delivering a testing execution command to the test equipment; and

recovering the subscriber's line to the service status after receiving the result of the test from the test equipment, sending the result of the test to the Operation Management and Maintenance Processor, and showing the result to the operator.

5,063,585

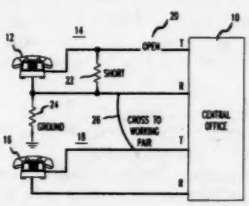
TELEPHONE SUBSCRIBER LINE FAULT DETECTOR

Roy A. Shapiro, Montclair, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 27, 1990, Ser. No. 589,286

Int. Cl.[5] H01M *1/24*

U.S. Cl. 379—30 **8 Claims**



1. A method of testing a telephone subscriber loop having a tip conductor and a ring conductor for a customer provided equipment telephone termination

comprising the steps of

measuring the impedance between the tip conductor and a ground terminal,

measuring the impedance between the ring conductor and the ground terminal,

measuring the impedance between the tip conductor and the ring conductor,

comparing the tip-ground impedance and ring-ground impedance with the tip-to-ring impedance to obtain two ratio values; and

comparing said two ratio values with a fixed ratio value to determine the presence of a customer provided equipment telephone termination on said telephone subscriber loop.

5,063,586

APPARATUS FOR SEMICONDUCTOR LITHOGRAPHY

Tanya E. Jewell, Bridgewater, N.J., and J. Michael Rodgers, Pasadena, Calif., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 420,967, Oct. 13, 1989, abandoned. This application May 30, 1990, Ser. No. 528,532

Int. Cl.[5] G21K *5/00;* **G02B** *5/10*

U.S. Cl. 378—34 **6 Claims**

1. Apparatus adapted for semiconductor lithography comprising

(a) means for holding an essentially flat mask member, the mask member to be exposed to process radiation during at least part of the time the apparatus is used,

(b) means for holding a semiconductor member in predetermined relationship with respect to the mask member, and

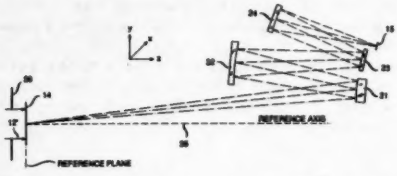
(c) projection system means adapted for forming a reduced size process radiation image of a predetermined region of the mask member on a surface of the semiconductor member, or on a processing layer disposed on the surface of the semiconductor member,

characterized in that

(d) the projection system means are adapted for use with process radiation of wavelength below about 30 nm;

(e) associated with the projection system means is an image field and a resolution over the image field, the image field having two dimensions, designated a and b, with a $\geqq$b, b$\gtrsim$0.1a, and b$\gtrsim$5 mm; and the resolution over the image field is higher than about 0.25 μm; and

(f) the projection system means contains four, and only four, curved mirrors for the process radiation that form a finite conjugate "optical" system that is telecentric at the short conjugate, the curved mirrors being, from long to short conjugate, a first convex, a first concave, a second convex and a second concave mirror, the mirrors selected such that the image of the predetermined region of the mask member is an essentially flat, diffraction limited image.

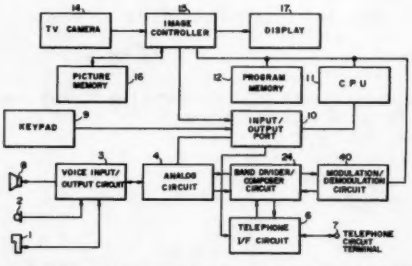


5,063,587

TRANSMISSION SYSTEM FOR STILL-PICTURE TV TELEPHONE

Takayoshi Semasa, and Yutaka Ueno, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 500,890
Claims priority, application Japan, Mar. 30, 1989, 1-79676
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—53 **14 Claims**



1. A still-picture TV telephone system for transmitting and receiving, via a telephone circuit, a still picture taken by a camera, comprising:

(a) a voice band filter means for eliminating a special band signal of a voice signal introduced from a transmitting means;

(b) a low-pass filter means for restricting a still picture signal in band, cut-off frequencies of said low-pass filter means being set to less than or equal to $\frac{1}{2}$ of the restricted band of said voice band filter means;

(c) a phase/amplitude modulation means for modulating the phase and amplitude of the still picture signal, high frequency components of which have been eliminated, by a carrier signal, frequencies of the carrier signal being set to substantially central frequencies of the signal-free band of said voice band filter means, a baud rate frequency being set substantially to the restricted band width of said voice band filter means; and

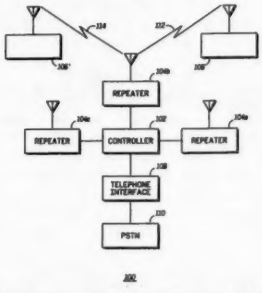
(d) a composer means for composing a picture transmission signal of modulated phase and amplitude in the narrow band and a voice transmission signal of the restricted band to divide frequency bands of the picture and voice signals and, at the same time, to transmit the picture and voice signals.

5,063,588

COMMUNICATION SYSTEM PROVIDING AUTOMATIC IDENTIFICATION OF CALLING PARTIES

Stelios J. Patsiokas; Brian Keith A. Johnson, both of Plantation, and Pierre E. Audet, Oakland Park, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 274,234, Nov. 21, 1988, abandoned.
This application Aug. 4, 1989, Ser. No. 393,114
Int. Cl.[5] H04M *1/57*
U.S. Cl. 379—57 **18 Claims**



18. In an RF communication system having a central unit and a plurality of portable subscriber transceiver units each having a unit identification code associated therewith, said central unit being interconnected with a wireline telephone network for receiving calls from a telephone party, a method for identifying a calling telephone party to a called portable subscriber transceiver unit, comprising the steps of:

at the central unit:

(a) receiving a signal from said calling telephone party;

(b) processing said signal to determine said calling telephone party's name;

(c) transmitting information representing said calling telephone party's name to at least one subscriber unit;

(d) receiving said code representing said command to record a message from said calling telephone party;

(e) transmitting a signal to said calling telephone party indicating that said message may be recorded from said calling telephone party;

at a portable subscriber transceiver unit:

(a) receiving said information representing said calling telephone party's name;

(b) displaying said calling telephone party's name; and,

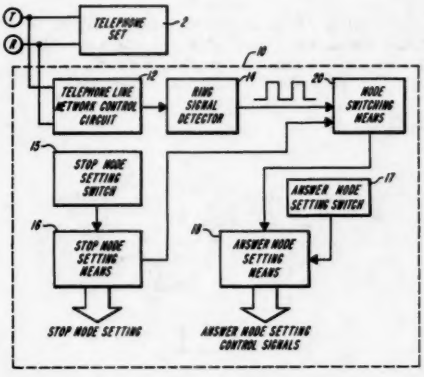
(c) transmitting a code to the central unit representing said command for the central unit to record said message from said calling telephone party.

5,063,589

AUTOMATIC TELEPHONE ANSWERING MACHINE WITH RING SIGNAL RESPONSIVE MODE CHANGING ARRANGEMENT

Masayuki Tsushima, Chofu, Japan, assignor to Tandy Electronics Japan, Ltd., Chofu, Japan

Continuation of Ser. No. 943,225, Dec. 18, 1986, abandoned. This application Nov. 30, 1989, Ser. No. 445,117
Claims priority, application Japan, Dec. 24, 1985, 60-198852
Int. Cl.[5] H04M *1/64*
U.S. Cl. 379—82 1 Claim



1. A telephone answering machine capable of being remotely activated comprising:

(a) switch means for selectively setting the machine in one of a plurality of modes in each of which the machine is powered on and operational, which modes include a stop mode in which the machine does not answer incoming calls and an automatic answer mode in which the machine answers incoming calls and records incoming messages,

(b) means for answering incoming calls when said machine is in said automatic answer mode,

(c) a microcomputer responsive to actuation of said switch means for providing control signals which set the machine in the selected mode,

(d) a ring signal detector for providing a train of output pulses derived from detected ring signals, each of said pulses having a first signal level generated when said ring signal detector detects ringing voltage and a second signal level when said ring signal detector detects telephone line voltage,

(e) stop mode setting means in the microcomputer for providing a stop signal when the machine is in the stop mode,

(f) mode switching means having a first input coupled to the output of the ring signal detector and a second input coupled to said stop mode setting means to receive said stop signal, said mode switching means comprising means for determining the duration of said first and second levels of said pulses, said mode switching means being responsive to said determining means to operate a counter means which counts the duration of said detected ring signals, for generating a mode switching output signal responsive to said counter reaching a specified count and said stop signal being provided, and

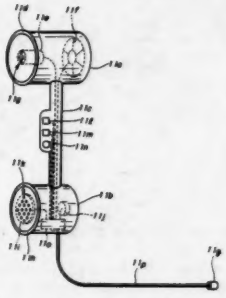
(g) answer mode setting means in said microcomputer responsive to said mode switching output signal from the mode switching means for setting the machine in the automatic answer mode, whereby the machine is able during the same incoming phone call to switch from the stop mode to the automatic answer mode and then answer the telephone call.

5,063,590

ACOUSTIC COUPLER AND DATA TRANSMISSION APPARATUS USING THE SAME

Takaho Koshiishi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 26, 1990, Ser. No. 543,481
Claims priority, application Japan, Jun. 29, 1989, 1-75558; Dec. 15, 1989, 1-144165
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—99 31 Claims



1. An acoustic coupler comprising:

a receive part housing having a first end and a second end;

a transmit part housing having a first end and a second end;

a coupling member mechanically coupling said receive part housing and said transmit part housing;

a first microphone fastened to the first end of said receive part and receiving an acoustic signal from a transmitter portion of a handset of a telephone when said acoustic coupler is set to said handset;

a first speaker fastened to the second end of said receive part and outputting an acoustic signal to an operator;

a second speaker fastened to the first end of said transmit part and outputting an acoustic signal to a receiver portion of the handset;

a second microphone fastened to the second end of said transmit part and inputting an acoustic signal from the operator; and

coupling means for electrically coupling said first microphone, said second microphone, said first speaker and said second speaker to a data transmission apparatus.

5,063,591

TOLL TICKETING RECORD GENERATION FOR BILLING OF INTERSYSTEM HANDOFF CALLS IN A MOBILE TELEPHONE SYSTEM

Dominique Jodoin, Chateuguay, Canada, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 26, 1990, Ser. No. 604,796
Int. Cl.[5] H04M *15/04, 15/16;* H04Q *7/02*
U.S. Cl. 379—115 6 Claims

1. A method for producing a toll ticketing record for a call with a mobile subscriber moving within the cells of a cellular mobile radio communications network which includes at least two different exchanges, an anchor exchange in which the mobile was located when the call began and a serving exchange into which the mobile moves while the call is in progress, said method comprising:

generating within said anchor exchange a toll ticketing record in response to the initiation of a call to which said mobile is a party, said record including a call identification number and a number identifying said mobile;

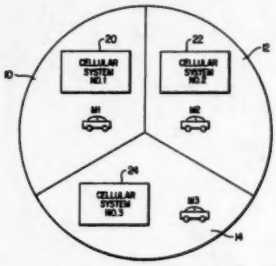
entering a start time in said toll ticketing record in response to an answer by the called party of said initiated call;

attempting a first handoff of the radio circuit of said mobile from said anchor exchange to said serving in response to

said mobile moving from the cells of one exchange to the other;

allocating a section of said toll ticketing record for information related to an intersystem call in response of said handoff being successfully completed;

entering a designation in the intersystem call section of said toll ticketing record as to the identity of the exchange to which the handoff was completed;



entering a start time in the intersystem call section of said toll ticketing record;

entering a stop time in the intersystem call section of said toll ticketing record in response to either the successful completion of a second handoff of the mobile from the serving to another exchange or to termination of the call;

entering a stop time in the toll ticketing record in response to termination of the call; and

outputting and releasing the toll ticketing record.

5,063,592

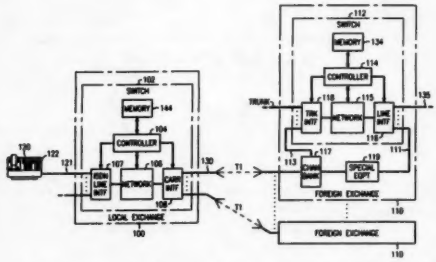
CONTROL OF NON-LOCALLY SWITCHED TELECOMMUNICATION SERVICES

Stephen J. Cannella, Edison, and Ali R. Zaringhalam, North Caldwell, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 29, 1989, Ser. No. 443,303

Int. Cl.[5] H04M *7/00*

U.S. Cl. 379—207 **22 Claims**



1. An arrangement for providing a connection from a first exchange to a remotely located telephone terminal, comprising:

a second exchange;

transmission means for interconnecting said first and said second exchanges;

said first exchange comprising first subscriber line interface means for connection to subscriber lines and means for establishing a direct unswitched connection from said first subscriber line interface means to said transmission means;

said second exchange comprising facilities interface means for connection to said transmission means, second subscriber line interface means for connection to a subscriber line connected to said remote terminal, network means for selective interconnecting said second line interface means and said facilities interface means and means responsive to origination signals on said subscriber line connected to said terminal for controlling said network to establish an interconnecting path between said second line interface means and said facilities interface means and for transmitting to said first exchange signals indicative of an origination at said remote terminal;

whereby a connection is selectively established between a subscriber line of said first exchange and said remotely located terminal via said second exchange and said second exchange transmits to said first exchange signals indicating an origination at said terminal.

5,063,593

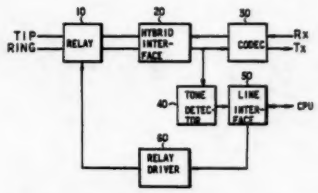
TONE-TYPE RECOGNITION METHOD

Oh-Seol Kwon, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Aug. 23, 1989, Ser. No. 397,254

Int. Cl.[5] H04M *1/00*

U.S. Cl. 379—386 **14 Claims**



7. A tone type recognition system for a central office line switching system, comprising:

a relay for connecting said recognition system to said central office line switching system;

a relay driver for driving said relay;

a hybrid interface receiving first signals from said relay for sending to a subscriber based on operation of the relay;

a tone detector for checking tones in signals received from said hybrid interface, for producing a second signal of high logic level if a tone is detected, and for producing a third signal of low logic level if no tone is detected;

a line interface for delivering said second or third signals from said tone detector to a microprocessor; and

a codec for converting analog voice signals received from said hybrid interface into digital signals.

5,063,594

VIDEO SIGNAL SCRAMBLING SYSTEM

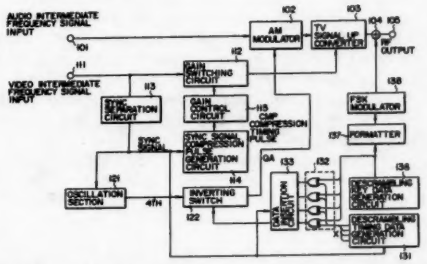
Shouji Uehara, Konosu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1990, Ser. No. 501,725

Claims priority, application Japan, Mar. 31, 1989, 1-83603

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—15 **20 Claims**



1. A video signal scrambling system comprising:

a transmission unit including:

a first signal source for generating an audio intermediate frequency signal;

a second signal source for generating a video intermediate frequency signal including a sync signal;

compression pulse generating means for generating a compression pulse in synchronism with the sync signal of the video intermediate frequency signal generated from said second signal source;

level compressing means for level-compressing a sync signal component of the video intermediate frequency signal in response to the compression pulse generated by said compression pulse generating means and outputting a level-compressed signal;

sine wave generating means for generating a first sine wave having a frequency n times a frequency of the sync signal in synchronism with the sync signal generated from said second signal source;

control data generating means for generating a second sine wave obtained by controlling a phase of the first sine wave generated by said sine wave generating means, said second sine wave including data representing a position at which the sync signal component is level-compressed;

superposing means for superposing the second sine wave from said control data generating means on the audio intermediate frequency signal from said first signal source and outputting a superposed signal; and

outputting means for outputting the level-compressed signal from said level compressing means and the superposed signal from said superposing means; and

a receiving unit including:

receiving means for receiving the level-compressed signal and the superposed signal output from said outputting means;

detecting means for detecting the level-compressed signal and the superposed signal received by said receiving means and extracting the second sine wave from the superposed signal;

compression position detecting means for discriminating a change in phase of the second sine wave extracted by said detecting means, detecting the position of the sync signal component compressed by said level compressing means based on a discrimination result, and outputting a detection signal;

expansion pulse generating means for generating an expansion pulse at a timing determined on the basis of the second sine wave extracted by said detecting means and the detection signal output from said compression position detecting means; and

level expanding means for expanding the level-compressed sync signal component of the level-compressed signal received by said receiving means in response to the expansion pulse generated from said expansion pulse generating means.

5,063,595

OPTICAL COMMUNICATIONS NETWORK

John W. Ballance, Woodbridge, England, assignor to British Telecommunications Public Limited Company, Great Britain

PCT No. PCT/GB88/01050, § 371 Date May 21, 1990, § 102(e) Date May 21, 1990, PCT Pub. No. WO89/05078, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 28, 1988, Ser. No. 488,046

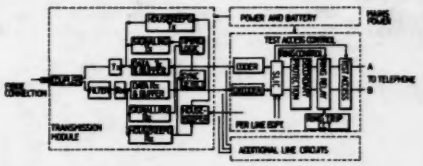
Claims priority, application United Kingdom, Nov. 27, 1987, 8727846

Int. Cl.[5] H04L *9/02*; H04K *1/00*

U.S. Cl. 380—48 **4 Claims**

1. A central station for a digital communications network, said central station comprising:

means for transmitting digital data to outstations in the form of a stream of frames, each frame comprising a first portion containing a digital synchronisation signal and digital housekeeping data for the outstations, and a second portion containing digital traffic data for the outstations, and scrambling means for scrambling the contents of said first



portions by a first predetermined binary sequence of digital signals, and for scrambling the contents of said second portions by a second predetermined binary sequence of digital signals.

5,063,596

ENCRYPTION PRINTED CIRCUIT BOARD

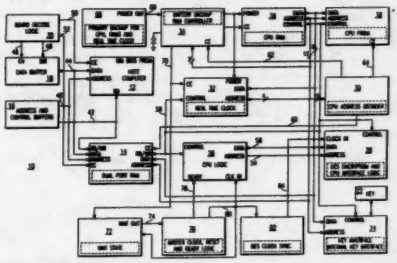
John Dyke, West Valley, Utah, assignor to MIU Automation Corporation, Santa Barbara, Calif.

Continuation of Ser. No. 314,916, Feb. 24, 1989, Pat. No. 4,910,776. This application Mar. 19, 1990, Ser. No. 495,335

The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—49 **23 Claims**



1. Expander board apparatus for encrypting and decrypting data resident on a host computer having an expansion slot, said expander board apparatus comprising:

board means locatable in said expansion slot;

ciphering means included with said board means and having:

first means for storing data transferred from the host computer to said expander board apparatus for encryption,

second means for encrypting and decrypting data stored in said first means,

third means for controlling the operation of said expander board apparatus by executing operating instructions stored in a source thereof,

fourth means for storing operating instructions to be executed by said third means, and

fifth means for obtaining key information from a key card reader for said third means;

sixth means included with said board means and connectable between the host computer and said ciphering means, said sixth means for permitting an amount of data to be written thereto by either of the host computer and said ciphering means while simultaneously allowing the data to be read by the other of said ciphering means and the host computer;

wherein said sixth means is connectable to the host computer expansion slot, for permitting the simultaneous but independent operation of the host computer and said expander board apparatus.

5,063,597

MUTING CIRCUIT IN A DIGITAL AUDIO SYSTEM

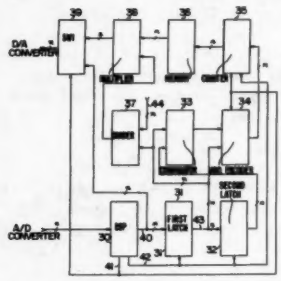
Jung-Hoon Seo, Seoul, and Sung-Mo Seo, Suwon, both of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Kyung Ki-Do, Rep. of Korea

Filed Aug. 18, 1989, Ser. No. 395,508

Claims priority, application Rep. of Korea, Aug. 23, 1988, 1988-10699

Int. Cl.[5] G10L *5/00*; G06F *11/10*

U.S. Cl. 381—47 17 Claims



1. A muting circuit for use in a digital audio system, comprising:

digital signal processor means for outputting a word clock signal, a mute control signal and a digital data word which is a digital speech signal from an analog-to-digital converter;

first latch means for receiving the digital data word and the word clock signal and for latching the digital data word in response to the word clock signal;

second latch means for latching and delaying the digital data word from the first latch means based upon the word clock signal;

comparator means for generating a comparison signal by comparing the digital data word of the first and second latch means to detect whether an amplitude of a waveform of the speech signal is in an increasing state or in a decreasing state;

address encoder means for receiving the comparison signal and most significant bit data of said digital data word of the first latch means, which is a code data, in response to the mute control signal and for generating a preset address;

counter means for receiving the preset address from the address encoder means and for generating incremented sequential addresses incremented by one at given times beginning with the preset address in response to the word clock signal from the digital signal processor means;

memory means for reading first digital data stored in advance at addresses corresponding to each of the sequential addresses of the counter means, incremented by one for a given time;

divider means for generating second digital data by dividing the digital data word, input from the first latch means to a first input port, by a fixed data inputted to a second input port;

multiplier means for generating third digital data by multiplying the first digital data read by the memory means and the second digital data generated by the divider means; and

first switching means for receiving the mute control signal and the digital data word generated from the digital signal processor means and the third digital data from the multiplier means, for selecting and outputting selectively the digital data word or the third digital data in response to a logic state of the mute control signal.

5,063,598

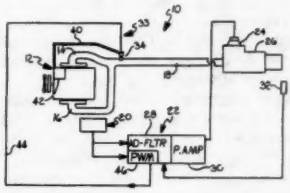
ACTIVE NOISE CONTROL SYSTEM WITH TWO STAGE CONDITIONING

Earl R. Geddes, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 25, 1990, Ser. No. 514,386

Int. Cl.[5] G10K *11/16*

U.S. Cl. 381—71 9 Claims



1. An active noise attenuation muffler for a motor vehicle engine exhaust conduit comprising:

a tracking source for generating a tracking signal representative of an input pulse train;

a transducer coupled to said conduit;

electronic control means for driving said transducer in response to said tracking signal and producing an output pulse train having a phase opposite to said input pulse train at a predetermined point along said conduit; and

means for pneumatically reducing the crest factor of said input pulse train.

5,063,599

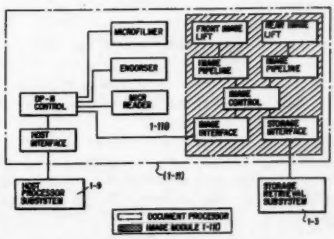
ELECTRONIC IMAGE LIFT

David Concannon, Farmington Hills; Gary Copenhaver, Canton; Johan Bakker, Union Lake; John Vala, Plymouth; Gerald Banks, Ann Arbor, and Clive Catchpole, Birmingham, all of Mich., assignors to Unisys Corporation, Detroit, Mich.

Filed Oct. 10, 1989, Ser. No. 419,574

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—7 10 Claims



1. A document processing system wherein documents are to be transported at high speed unidirectionally along a prescribed transport path past a pair of offset front and rear image-lift sites for scanning the entirety of respective front and rear document faces, this system comprising:

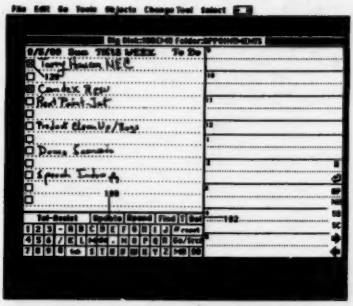
transport means for continuously transporting documents past said sites at high speed, and without pause; singular, common energy-source means for directing lift-energy at both said sites, in parallel; energy-conveying means between said energy-source means and both said sites for guiding said lift-energy to each said site; a pair of identical energy-shaping gate means, one disposed at each of said sites, each acting to channel imaging energy there; and heat-dissipation means disposed operatively adjacent said energy-source means and acting to extract IR energy therefrom and dissipate it so as to shield the said sites and said energy conveying means from adverse IR effects; this heat-dissipation means comprising an IR-trap.

5,063,600

HYBRID INFORMATION MANAGEMENT SYSTEM FOR HANDWRITING AND TEXT

Donald D. Norwood, P.O. Box 2284, Sunnyvale, Calif. 94087

Filed May 14, 1990, Ser. No. 523,230
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—13 **22 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 115 Pages)



1. A computer information system for handwriting and text, comprising:

a) a computer including a non-volatile storage area and a display;

b) means, including a digitizing pen for indicating positional coordinate information of said pen as an image on said display when said pen is moved, and for initiating a plurality of commands to said computer based upon the position of said image on said display;

c) means for entering digital information into said computer;

d) means for entering handwritten and text information into said storage area and displaying said information on said display;

e) means for creating, in said storage area, handwriting files which accept handwritten information as well as text and which can be calendar-sequenced upon user direction, and can have date indicia and positional format areas, said date indicia and said positional format areas being in a calendar format;

f) means for manipulating said handwritten and text information within and between said handwriting files in a plurality of different ways in accordance with said respective plurality of commands;

g) means for indexing, storing, retrieving, copying and deleting said handwriting files in said computer;

h) means for creating a program object image on said display, said program object image representing a visual element of a programming system, which is created by a command to said programming system, which appears as an image on said display, which possesses one of a plurality of programmer-controllable physical shapes or sizes, including that of a button object image, which can be moved to any location on said display, which can have program commands associated with it such that a program associated with said program object image can be activated by a user to perform specific program actions;

an improvement comprising:

i) means for allowing said user (1) to create, and place one or more of said program object images on an image of one of said handwriting files on said display, and (2) to associated one or more of said program object images with any specific section of said handwritten information; whereby labor savings or other beneficial actions produced by said user's activation of said program object image associated with said specified handwritten information can be derived repeatedly without repeated creation of said program object image or the commands that it automates;

j) means which can be activated by said user to move as a group only said specific sections of handwritten information and some or all of said program object images associated with said specified section of handwritten information to a specific location within or across said handwriting files which accept handwriting, such that the associations between said specific section of handwritten information and said program object images are preserved; whereby the substantial labor to recreate said linkages can be eliminated which otherwise would be necessary for said user to derive the benefit of said associations in another file location or in a different file; and

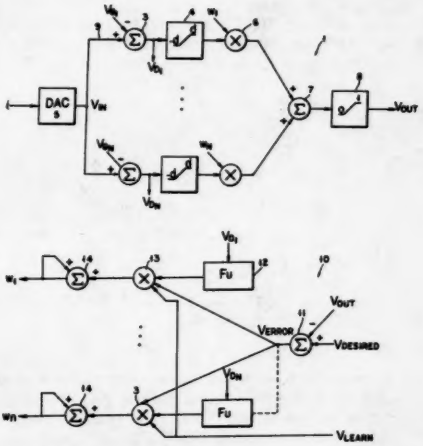
k) means for identifying precisely said specific section of handwritten information which may be carried out by one of a plurality of techniques, including encirclement of the desired material by the user with a line drawing cursor.

5,063,601

FAST-LEARNING NEURAL NETWORK SYSTEM FOR ADAPTIVE PATTERN RECOGNITION APPARATUS

John Hayduk, 15 Partridge Rd., White Plains, N.Y. 10605

Filed Sep. 2, 1988, Ser. No. 240,746
Int. Cl.[5] G06K 9/62
U.S. Cl. 382—14 **1 Claim**



1. A neural network system comprising:

a recall circuit including input means and output means and a plurality of parallel comparator circuits connected to said input means, each said comparator including a summing circuit for summing an input signal from said input means with an offset voltage, a threshold detector coupled to said summing circuit for detecting when the summer output is within a preselected range and a multiplier for multiplies the threshold circuit output by a weight "wherein said threshold circuit generates a threshold output which equals to the summer output and other wise equals to one of high and low threshold level".

a series resistor circuit for generating said offset voltages; and

a feedback circuit including a plurality of function blocks, each function block being coupled to one of said comparator circuits for operating on a comparator signal from one said comparator circuit in accordance with a preselected function, said feedback circuit generating said weights for said multiplies;

wherein said feedback circuit has feedback input means for receiving a learning signal and connected to said input means and output means for an output signal, said feed-

back circuit recursively calculating said weights in the presence of said learning signal by changing said weights until said output signal equals a reference signal said feedback input circuit includes feedback summer for receiving said output signal and said reference signal, said feedback input circuit includes feedback summer for receiving said output signal and said reference signal, said feedback summer generating an error signal equal to the difference between said output and said reference signals, and feedback multipliers for multiplying the outputs of said function blocks with said error signal in the presence of said learn signal, said function block operates on each said comparator signal in accordance with the equation:

$$F_{dk}(V_{dk})=\eta SGN(V_{dk})e^{-P/dlVdkl}$$

where $0<\eta\leq 1$ is called the learning constant, SGN is the signum function and returns the signal of the argument, K ranges from 1 to n. and P is a shape constant which governs the shape of the response.

5,063,602

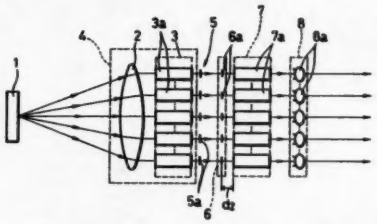
IMAGE CORRELATION CALCULATION APPARATUS

Norman A. Peppers, Belmont; James R. Young, Palo Alto; Gerald A. Pierce, Redwood City, all of Calif., and Hisami Nishi, Nishinomiya, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of Ser. No. 206,572, Jun. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 38,634, Apr. 14, 1987, abandoned. This application Mar. 26, 1991, Ser. No. 679,161

Int. Cl.[5] G06K 9/74

U.S. Cl. 382—32 **12 Claims**



1. An image correlation calculation apparatus comprising:

a multiplier for optically multiplying an image subjected to correlation calculations to form a plurality of optical pattern images of a substantially identical shape;

a plurality of reference masks respectively having reference patterns subjected to correlation calculations with the optical pattern images, said reference masks being arranged at a position spaced apart by a predetermined distance from said plurality of optical pattern images in one-to-one correspondence therewith so that beams from all points of each optical pattern image are incident on all points of the corresponding reference pattern;

a plurality of condenser lenses which are arranged to have parallel optical axes at a predetermined position in one-to-one correspondence with said reference masks for condensing the beams of each optical pattern image passing through said reference masks whereby an optical correlation calculation between said optical pattern image and said reference pattern can be performed instantaneously, said predetermined distance satisfying the inequality $D<2d_1\{p/(1-p)\}$ where d_1 is the distance from said multiplier to said optical pattern images and p is the ratio of the size of said optical pattern images to the size of the aperture of said condenser lenses; and

photodetecting means for detecting the beams which are emitted from the plurality of condenser lenses, whereby an optical correlation calculation between said optical pattern image and said reference pattern is performed instantaneously without having to shift said reference masks with respect to the optical pattern image.

5,063,603

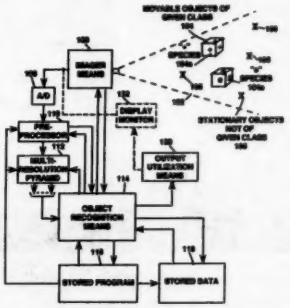
DYNAMIC METHOD FOR RECOGNIZING OBJECTS AND IMAGE PROCESSING SYSTEM THEREFOR

Peter J. Burt, Princeton Township, Mercer County, N.J., assignor to David Sarnoff Research Center, Inc., Del.

Filed Nov. 6, 1989, Ser. No. 432,013

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—37 **19 Claims**



1. A dynamic image-processing method for recognizing objects of a given class graphically represented in a time series of successive relatively high-resolution frames of image data; said method being responsive to (A) a stored program for controlling said image-processing and for specifying a set of decision criteria, and (B) stored data;

wherein objects of said given class all possess a group of known generic attributes which, taken as a whole, distinguish objects of said given class from objects not of said given class; and

wherein said stored data initially defines a limited number of separate features related to said group of generic attributes, any of which initially stored features is likely to be present in a sequence of one or more successive frames of image data if an object of said given class is graphically represented in that sequence;

said method comprising the steps of:

a) under the control of said stored program and in response to at least a first one of said separate features initially defined by said stored data, making a first determination in accordance with said decision criteria as to a first probability that one or more relatively early-occurring frames of said time series may include as part of said image data thereof at least said first one of said separate features of objects of said given class;

b) in response to said first probability being at least equal to a first predetermined threshold value, adding data defining at least the relative location of said part within the relatively early-occurring frames of said sequence to said stored data, thereby enhancing said stored data;

c) under the control of said stored program and in response to said enhanced stored data, making a second determination in accordance with said decision criteria as to a second probability that one or more relatively later-occurring frames of said time series verifies said part as including at least a second one of said separate features in addition to said first feature;

d) in response to said second probability being above a second predetermined threshold, recognizing said part as being a graphical representation of an object of said given class;

e) in response to said second probability being below a third predetermined threshold which third predetermined threshold is significantly below said second pre-

determined threshold, recognizing said part as not being a graphical representation of an object of said given class;

f) in response to said second probability being in a range between said second and third probabilities, adding further data defined by the verification of step c) to said stored data, thereby further enhancing said stored data; and

g) if said second probability is in said range, recursively repeating steps c) and f) for relatively later and later occurring sequences of one or more frames of said time series until the probability determined by such repeated step d) either rises above said second predetermined threshold or falls below said third predetermined threshold.

5,063,604

METHOD AND MEANS FOR RECOGNIZING PATTERNS REPRESENTED IN LOGARITHMIC POLAR COORDINATES

Carl F. R. Weiman, Westport, Conn., assignor to Transitions Research Corporation, Danbury, Conn.

Filed Nov. 8, 1989, Ser. No. 434,100
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—41 25 Claims

1. A method of processing image data to detect the presence of an extended feature or features of interest therein, the method comprising the steps of:

providing an image represented in a logarithmic polar (log-polar) coordinate system;

selecting image points which are candidates for membership in the feature of interest;

for each selected image point, constructing a curve in the same logarithmic polar coordinate system as the image, the curve characterizing the locus of possible locations of the feature of interest consistent with the selected image point;

accumulating a histogram whose bins coincide with points in the same logarithmic polar coordinate system as the image, which bins contain counts of the number of constructed curves intersecting at the location of the bin; and

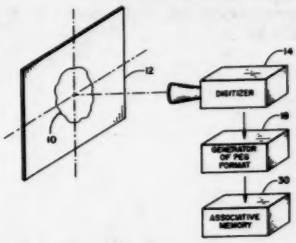
selecting bins having greatest counts as representing the locations of definitive points for characterizing the location of the extended feature of interest within the image.

5,063,605

METHOD FOR SCALE AND ROTATION INVARIANT PATTERN RECOGNITION

Tariq Samad, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 4, 1990, Ser. No. 549,871
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—44 11 Claims



1. A method for preparing an image of an object for representation is an associative memory comprising the steps of:

preparing on a rectilinear grid of source cells a digitized image of said object within a background which is centered relative to its "center of mass",

preparing a polar grid format having a circumference fully contained within said background and large enough to fully contain any object to be represented and destination cells formed by a plurality of sectors of equal angles and a plurality of rings spaced at different radii from the center of said circumference,

mapping said image from said rectilinear grid to said polar grid and determining for each of said destination cells the number of said source cells within its bounds occupied by said object, and

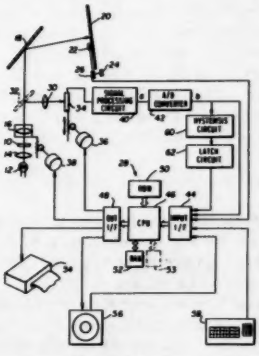
designating as active each of said destination cells for which said number exceeds a predetermined criterion.

5,063,606

METHOD OF AND DEVICE FOR DETECTING AN IMAGE AREA IN AN IMAGE PROCESSOR

Tetsuya Takamori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 25, 1989, Ser. No. 398,560
Claims priority, application Japan, Aug. 26, 1988, 63-210800
Int. Cl.[5] G06K 9/20, 9/48, 9/00
U.S. Cl. 382—48 6 Claims



3. An image processor for selecting and reading a designated image area as a desired image area from plural image areas included in a frame of a microfilm through scanning operations, said processor comprising:

image sensor means for scanning said frame including said plural image areas;

image area detecting circuit means for detecting said plural image areas from marginal portions of said frame;

a latch circuit for determining only a single designated image area, including a pre-set position in the frame, from said plural image areas as said desired image area;

memory means for storing an address of the periphery of said designated image area; and

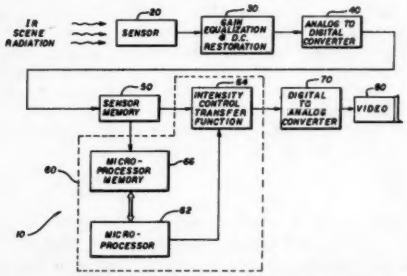
mask means for extracting the designated image area defined by said address.

5,063,607

IMAGE CONTRAST ENHANCEMENT TECHNIQUE

Patrick FitzHenry, Los Angeles, and Lawrence A. Scanlan, Westchester, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 24, 1988, Ser. No. 261,812
Int. Cl.[5] G06K 9/38
U.S. Cl. 382—50 9 Claims



1. An image contrast enhancement technique for adjusting the intensity of an image of a scene, said image being realized from electrical signals generated in response to radiation received from a plurality of regions within a field of view of said scene, comprising the steps of:

a) filling a first matrix with a plurality of digital entries corresponding to each of said electrical signals, said plurality of digital entries having a maximum and a minimum value with the difference between the maximum and minimum digital entries defining a first dynamic range;

b) sampling said first matrix to create a first sample set of said plurality of digital entries, said sample set having a second dynamic range substantially similar to said first dynamic range;

c) constructing a histogram of said first sample set of digital entries;

d) at least approximating the integral of said histogram to generate a first transfer function, said first transfer function having a value at each of said plurality of digital entries of said first matrix;

e) generating a second matrix having a plurality of digital entries obtained by multiplying each of said plurality of digital entries of said first matrix by the value of said first transfer function at each of said entries; and

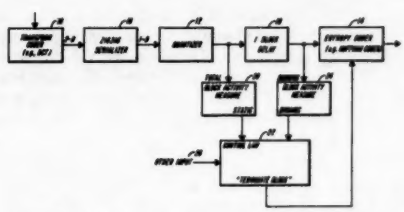
f) generating said image by driving a display with signals derived from said plurality of digital entries of said second matrix.

5,063,608

ADAPTIVE ZONAL CODER

Shepard L. Siegel, Derry, N.H., assignor to Datacube Inc., Peabody, Mass.

Filed Nov. 3, 1989, Ser. No. 431,548
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—56 9 Claims



1. A method for image data compression comprising the steps of:

transforming a two-dimensional block of image data in a spatial domain to resulting data in a frequency domain represented as a two-dimensional array of activity coefficients;

serializing said entire two-dimensional array of coefficients, yielding a one-dimensional array of coefficients with a leading coefficient and an original trailing coefficient;

quantizing said one-dimensional array of coefficients;

selecting a portion of said one-dimensional array of coefficients beginning with said leading coefficient and ending with a new trailing coefficient that is closer to the leading coefficient than said original trailing coefficient, wherein said portion is selected by a process comprising the steps of:

obtaining a measure of total activity of said one-dimensional array of coefficients,

determining in real time a measure of activity of successive sub-portions of said one-dimensional array, and adding said measure of activity to a running total,

performing a comparison in real time of said running total to a setable level based on said measure of total activity, and

designating a new trailing coefficient according to said comparison;

appending an end-of-block symbol after said new trailing coefficient; and

encoding only said portion with an entropy coder.

5,063,609

STEAM GENERATOR

D'Arcy Lorimer, Santa Clara, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Oct. 11, 1989, Ser. No. 419,865
Int. Cl.[5] F22B 1/28
U.S. Cl. 392—401 25 Claims

1. A steam generator comprising,

a plurality of stacked, interconnected, vertically-oriented liquid-holding chambers, there being a top chamber and a bottom chamber, each chamber having a sidewall and a bottom wall,

means for introducing water into the top chamber,

means within the sidewall of each of said chambers above the bottom chamber for communicating overflow water from a higher chamber to a lower chamber, the bottom chamber having a drain means for removing water reaching the bottom chamber,

means for heating the water in each chamber to create steam

in each of said chambers, said heating means immersed in liquid in each chamber,

means for conducting said steam from a lower chamber to the chambers above, the steam migrating upwardly to a collection zone,

means for releasing said steam from said collection zone.

5,063,610

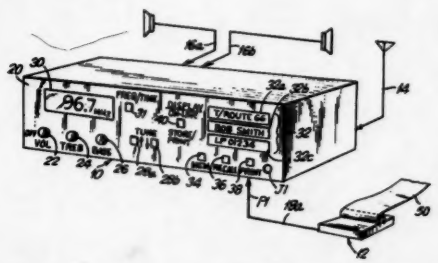
BROADCASTING SYSTEM WITH SUPPLEMENTAL DATA TRANSMISSION AND STORAGE

David Alwadish, New York, N.Y., assignor to Ing Communications, Inc., New York, N.Y.

Continuation of Ser. No. 413,536, Sep. 27, 1989, abandoned. This application Feb. 28, 1991, Ser. No. 663,298

Int. Cl.[5] H04B *7/00*

U.S. Cl. 455—45 **30 Claims**



1. A method of broadcasting whereby supplemental information is encoded for transmission together with program material, comprising the steps of:

reproducing at a broadcast site a source of program material;

processing the reproduced program material for transmission over a broadcast carrier signal;

inserting encoded items of information associated with the program material into the carrier signal upon transmission of the program material;

receiving the transmitted carrier signal and reproducing the program material at a receiver;

decoding, at said receiver, the information items inserted into the carrier signal in association with the program material;

providing said receiver with display means for displaying the decoded items of information;

providing said receiver with memory means;

selecting desired decoded items of information associated with the program material for storage in the memory means by entering a memory command to the receiver;

storing the desired decoded items of information in the memory means;

selecting one of a first and a second display mode for the display means by actuating a manual selecting means;

displaying on said display means information items as decoded from the carrier signal in said decoding step, when the first display mode is selected; and

displaying on said display means the decoded items of information that are stored in said memory means after entering a recall command to the receiver, when the second display mode is selected.

5,063,611

THEFT-PROTECTED VEHICULAR ACCESSORY APPARATUS, PARTICULARLY CAR RADIO AND AUDIO EQUIPMENT

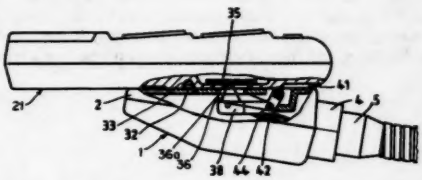
Shinichi Kitabayashi, Tokyo, Japan, assignor to Blaupunkt Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,271

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 8711687

Int. Cl.[5] H04B *1/08*

U.S. Cl. 455—348 **15 Claims**



1. The combination of

a vehicular accessory apparatus, particularly car radio and audio equipment (R) with

a two-part control unit (1, 21) for said apparatus,

wherein said accessory apparatus is secured in the vehicle (V) and

wherein, in order to render said accessory apparatus operable, said control unit (1, 21) must be assembled with said accessory apparatus in said vehicle, and

wherein said two-part control unit comprises

an essentially stationary connection part (1) mechanically secured to the vehicle (V) and means (5, 43) for electrically coupling the connection part to said accessory apparatus; and

a portable control part (21), formed with generally smooth outer surfaces to facilitate transport in an owner's pocket, and which includes a housing (22, 23) having control elements (28, 43) necessary for operation of said accessory apparatus located thereon,

interengaging attachment means (8, 9; 24, 25) for selectively separably mechanically connecting together said connection and control parts (21); and

electrical coupling means (35, 36*a*) positioned, respectively, on said control part (21) and said connection part (1) to permit control of said apparatus (R) when the connection part and the control part are interengaged, while allowing separation of said control part and said connection part and removal of said control part from the connection part, said coupling means including means (38, 40, 41) for automatically extending terminal elements (36*a*) during interengagement of said control and connection parts and for automatically retracting said terminal elements (36*a*) into a housing (2, 3) upon disengagement of said control and connection elements.

5,063,612

NETWORK TRANSCEIVER

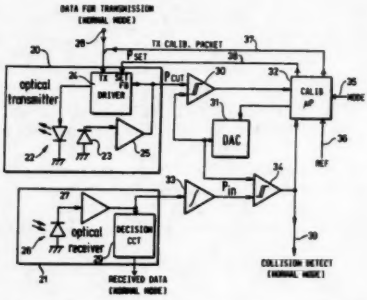
Nicholas W. McKeown, Berkeley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 3, 1990, Ser. No. 562,333

Claims priority, application European Pat. Off., Aug. 11, 1989, 89308191.9

Int. Cl.[5] H04B *10/08*

U.S. Cl. 455—607 11 Claims



1. A transceiver for a station of a network of the type in which a plurality of stations are connected via links to a network common point through which a transmission received from any one of said stations passes on its way to any other of said stations, said transceiver being operative both in a normal mode, in which it serves for the transmission and reception of data over said network, and in a calibration mode, and comprising:

a transmitter with an adjustable output power level;

a receiver; and

adjustment means connected to said transmitter and operative when the transceiver is in said calibration mode to set the output power level of said transmitter such that the resultant power produced at said network common point is at a desired level, said adjustment means comprising:

first monitoring means for generating a first power level signal indicative of the output power level of said transmitter,

second monitoring means for generating a second power-level signal indicative of the received power level at said receiver,

reference setting means for providing a reference signal indicative of a desired power level at said network common point, and

control means connected to receive said first and second power-level signals and said reference signal, said control means being operative, when the transceiver is in said calibration mode, to adjust the output of said transmitter using a calibration signal determined by utilizing said first and second power-level signals and the reference signal to determine the transmitter output power level required to produce a power level at said network common point corresponding to the level represented by the reference signal and thereafter setting the transmitter output power level to this determined level using said calibration signal.

DESIGNS

NOVEMBER 5, 1991

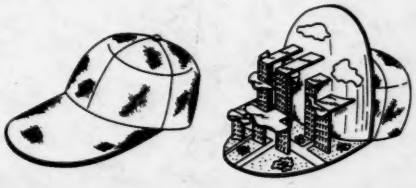
321,270
SATURN-SHAPED PASTA
Edward J. Meyers, Jr., Roselle Park, N.J.; Deborah L. Bernardini, Mahopac, N.Y.; Frank Ceglia, and Eileen Fogarty, both of New York, N.Y., assignors to CPC International Inc., Englewood Cliffs, N.J.
Filed Dec. 22, 1989, Ser. No. 456,137
Term of patent 14 years
U.S. Cl. D1—106

321,271
LION-SHAPED PASTA
Edward J. Meyers, Jr., Roselle Park, N.J.; Deborah L. Bernardini, Mahopac, N.Y.; Frank Ceglia, and Eileen Fogarty, both of New York, N.Y., assignors to CPC International Inc., Englewood Cliffs, N.J.
Filed Dec. 22, 1989, Ser. No. 456,138
Term of patent 14 years
U.S. Cl. D1—107

321,272
VAMPIRE-SHAPED PASTA
Edward J. Meyers, Jr., Roselle Park, N.J., and Deborah L. Bernardini, Mahopac, N.Y., assignors to CPC International Inc., Englewood Cliffs, N.J.
Filed Dec. 29, 1989, Ser. No. 459,113
Term of patent 14 years
U.S. Cl. D1—109

321,273
NURSING BRA CUP OR THE LIKE
Elinor R. Hull, 736 Meadow Branch Rd., Westminster, Md. 21151
Filed Jan. 18, 1989, Ser. No. 298,065
Term of patent 14 years
U.S. Cl. D2—24

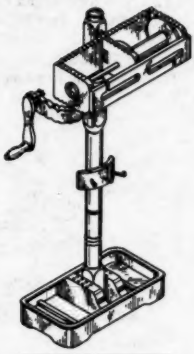
321,274
NOVELTY HAT
Kyoung M. Hur, 405 Park Ave., Apt. N, Rutherford, N.J. 07070
Filed Dec. 19, 1988, Ser. No. 285,948
Term of patent 14 years
U.S. Cl. D2—248



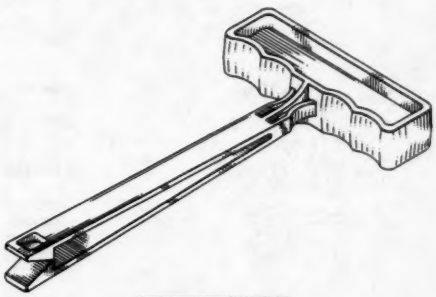
321,275
TREAD SURFACE AND PERIPHERY OF A FOOTWEAR UNIT SOLE
Arnold S. Austin, Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Mar. 27, 1989, Ser. No. 328,692
The portion of the term of this patent subsequent to Jun. 5, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—320

321,276
NECKTIE
Arthur N. Weeks, 254 Colony Green Dr., Bloomingdale, Ill. 60108
Continuation-in-part of Ser. No. 821,468, Jan. 22, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 259,097
Term of patent 14 years
U.S. Cl. D2—605

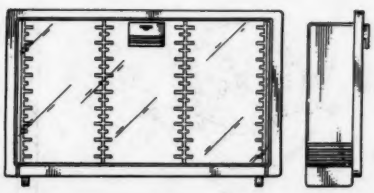
321,277
YARN HOLDER OR SIMILAR ARTICLE
John T. Tussing, and Ronald D. Tussing, both of Rte. 1, Box 229T, Rusk, Tex. 75785
Filed Sep. 14, 1988, Ser. No. 244,256
Term of patent 14 years
U.S. Cl. D3—26



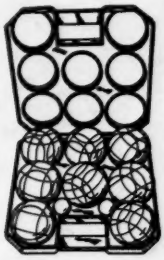
321,278
SKI BOOT TOTE
Robert J. Holcomb, E. 317 Silver Pines Ct., Colbert, Wash. 99005
Filed Aug. 24, 1988, Ser. No. 236,133
Term of patent 14 years
U.S. Cl. D3—36



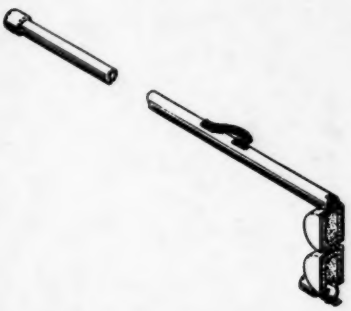
321,279
STORAGE UNIT FOR AUDIO TAPES, COMPACT DISKS, VIDEO TAPES OR SIMILAR ARTICLES
Andrew Mark, Stamford, Conn., assignor to Rogers Manufacturing Company, Inc., Rockfall, Conn.
Filed Nov. 15, 1989, Ser. No. 438,670
Term of patent 14 years
U.S. Cl. D3—35



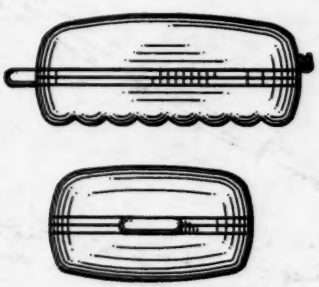
321,280
COMBINED BALL HOLDER AND SET OF GAME BALLS
Mario D'Angeli, 2722 Lucile Dr., Stockton, Calif. 95209
Filed Jun. 26, 1989, Ser. No. 371,017
Term of patent 14 years
U.S. Cl. D3—36



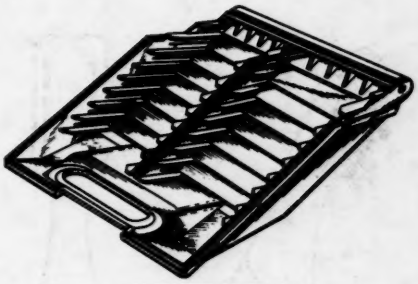
321,281
FLY ROD CASE
Dennis Cooper, Site 12, R.R. #1, Winfield, B.C., Canada V0H 2C0
Filed Jul. 15, 1988, Ser. No. 219,131
Term of patent 14 years
U.S. Cl. D3—38



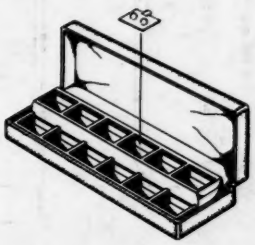
321,282
CARRYING CASE FOR AN INFLATABLE WASH BASIN
John F. Sigmon, 319 S. Madison St., Marion, N.C. 28752
Filed Oct. 19, 1987, Ser. No. 110,509
Term of patent 14 years
U.S. Cl. D3—39



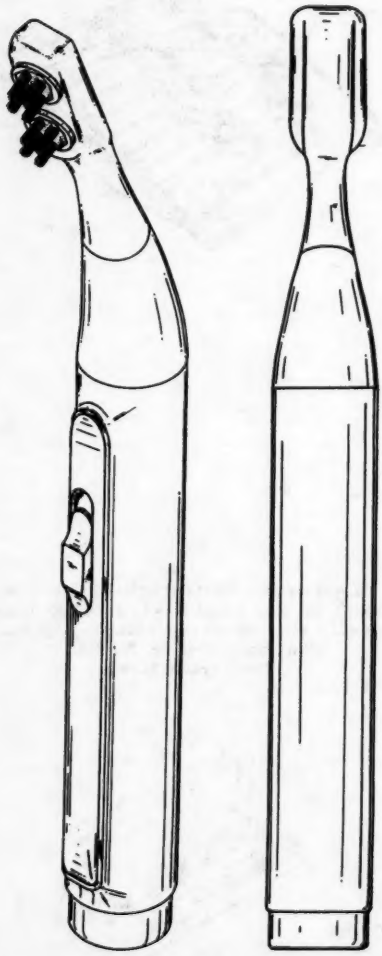
321,283
CARRYING CASE TRAY BOTTOM FOR CASSETTES OR THE LIKE
Thomas J. Melk, Chicago, Ill., assignor to Outer Circle Products, Ltd., Chicago, Ill.
Filed Nov. 21, 1988, Ser. No. 274,031
Term of patent 14 years
U.S. Cl. D3—74



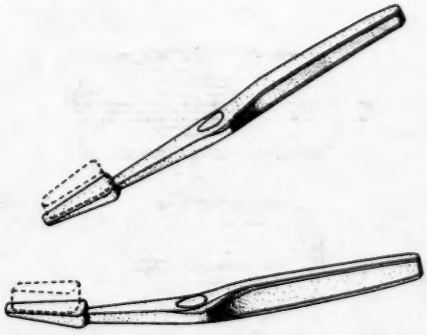
321,284
JEWELRY BOX AND INTERIOR THEREFOR
Kenneth S. Marsella, Johnston, R.I., and Frank Layne, Ft. Lauderdale, Fla., assignors to Ken Mar Inc., Cranston, R.I.
Filed Mar. 20, 1989, Ser. No. 326,529
Term of patent 14 years
U.S. Cl. D3—75



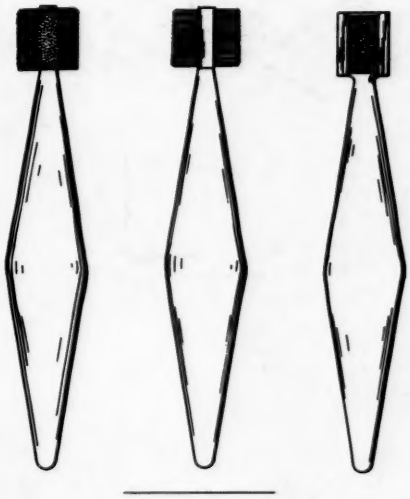
321,285
ELECTRIC TOOTHBRUSH
Akira Hirabayashi, Ikusaka, Japan, assignor to Kabushiki Kaisha Izumi Seiki Seisakusho, Matsumoto, Japan
Filed Jun. 30, 1989, Ser. No. 373,482
Claims priority, application Japan, Mar. 6, 1989, 1-8108
Term of patent 14 years
U.S. Cl. D4—101



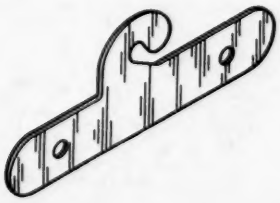
321,286
BRUSH HANDLE
Thomas B. Aldrich, Spring Valley, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Nov. 30, 1988, Ser. No. 278,074
Term of patent 14 years
U.S. Cl. D4—104



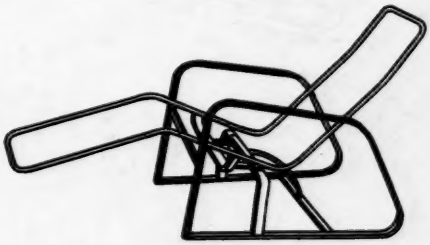
321,287
TOOTHBRUSH
Douglas R. Woll, and Margo Y. Woll, both of 3311 Woodview Lake Rd., West Bloomfield, Mich. 48033
Filed Sep. 2, 1988, Ser. No. 240,230
Term of patent 14 years
U.S. Cl. D4—106



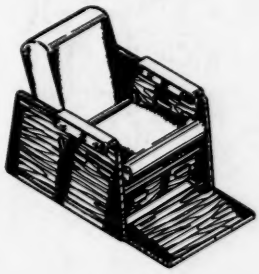
321,288
HOSIERY DISPLAY HANGER
William H. Nichol, Jr., 123 W. 7th St., P.O. Box 550, Hopkinsville, Ky. 42240
Filed May 3, 1989, Ser. No. 347,286
Term of patent 14 years
U.S. Cl. D6—315



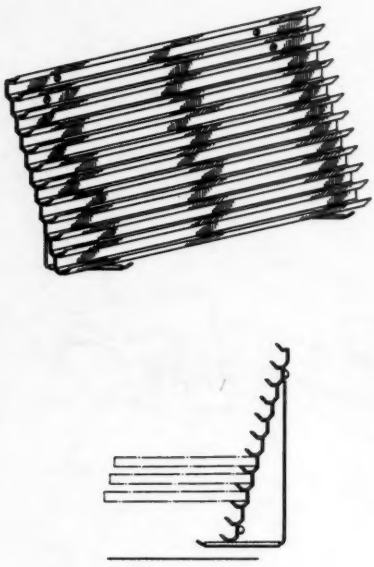
321,289
CHAISE FRAME
Herbert C. Saiger, Troy, Ohio, assignor to Crown Leisure Products, Inc., Owosso, Mich.
Filed Sep. 9, 1988, Ser. No. 243,643
Term of patent 14 years
U.S. Cl. D6—361



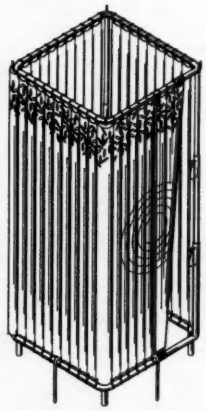
321,290
COMBINED CHAIR AND RETRACTABLE FOOTREST
William B. Laird, c/o Blockhouse Co., Inc., 121 First Ave., Red Lion, Pa. 17351
Filed Jun. 17, 1988, Ser. No. 211,526
Term of patent 14 years
U.S. Cl. D6—367



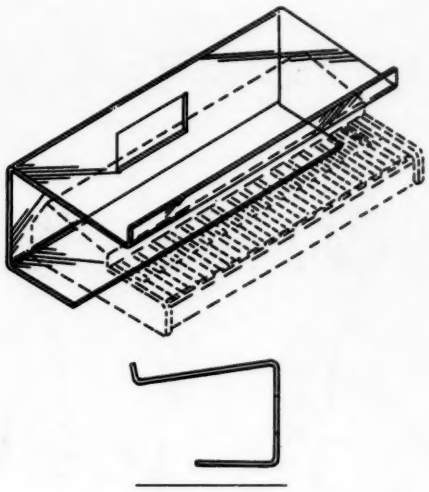
321,291
STORAGE RACK FOR COMPACT DISCS, CASSETTES AND THE LIKE
Stephen P. Shoemaker, Jr., 123 International Boardwalk, Redondo Beach, Calif. 90277, and Eric L. Brashear, 1663 Industrial Ave., Unit H, Norco, Calif. 91760
Filed Nov. 21, 1989, Ser. No. 439,568
Term of patent 14 years
U.S. Cl. D6—407



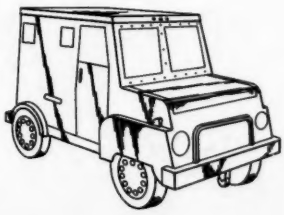
321,292
PORTABLE DRESSING ROOM
Deborah A. Gabriel, Rte. 3, Box 99, McComb, Miss. 39648
Filed Aug. 10, 1987, Ser. No. 83,300
Term of patent 14 years
U.S. Cl. D6—417



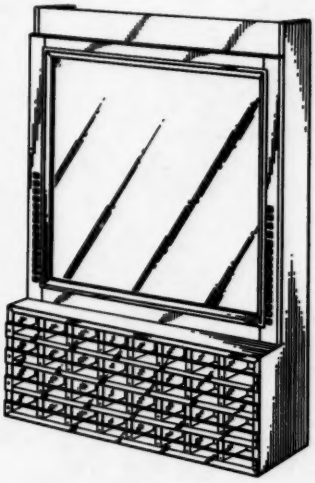
321,293
KEYBOARD STAND
Michael G. Kucsak, 367 Carteret Ave., Carteret, N.J. 07006
Filed Aug. 24, 1988, Ser. No. 235,987
Term of patent 14 years
U.S. Cl. D6—419



321,294
TOY CHEST
William M. Ross, 6603 Church St., Apt. D-1, Riverdale, Ga. 30274
Filed Jun. 12, 1989, Ser. No. 364,990
Term of patent 14 years
U.S. Cl. D6—434

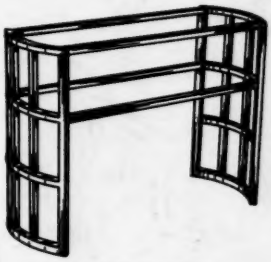


321,295
ADVERTISING CABINET
Sylvia Nuebler, Mosman, Australia, assignor to Jean Perrier, Mosman, Australia
Filed Feb. 26, 1988, Ser. No. 162,348
Term of patent 14 years
U.S. Cl. D6—444

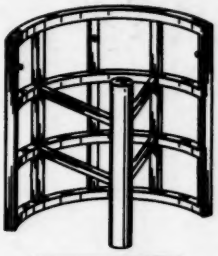


321,296
DISPLAY STAND
Walter R. Miranda, Chicago, Ill., assignor to RTC Industries, Inc., Chicago, Ill.
Filed Apr. 11, 1988, Ser. No. 180,274
Term of patent 14 years
U.S. Cl. D6—461

321,297
TABLE BASE
Robert C. Winzeler, III, Fremont, Ind., assignor to Design Institute of America, Jasper, Ind.
Filed Feb. 23, 1989, Ser. No. 314,594
Term of patent 14 years
U.S. Cl. D6—495

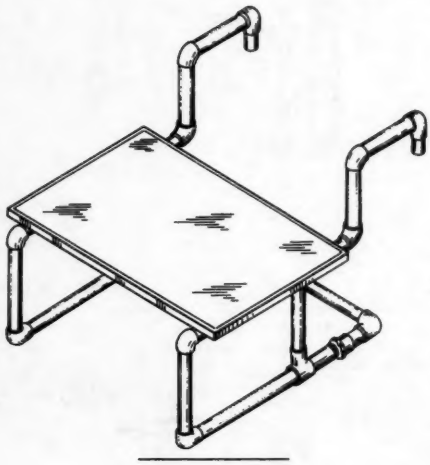


321,298
TABLE BASE
Robert C. Winzeler, III, Fremont, Ind., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Feb. 23, 1989, Ser. No. 314,596
Term of patent 14 years
U.S. Cl. D6—495

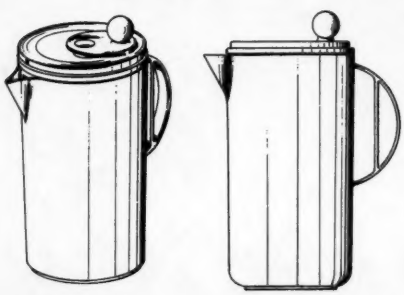


321,299
CHAIR BASE
Jerome C. Caruso, Lake Forest, Ill.; Christopher G. Estkowski, Coloma, Mich., and Lennard V. Lastuck, Granger, Ind., assignors to Shepherd Products U.S., Inc., St. Joseph, Mich.
Filed Aug. 22, 1988, Ser. No. 234,499
The portion of the term of this patent subsequent to Nov. 7, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—498

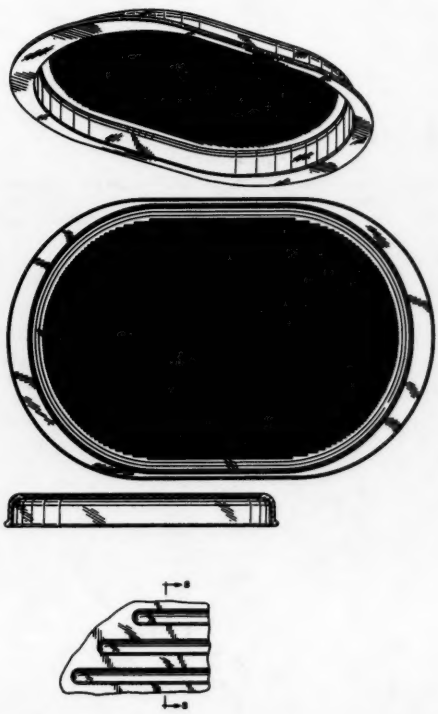
321,300
PORTABLE TRAY
Stephen Postic, 1496 Pembroke St., Bridgeport, Conn. 06608
Filed Jul. 18, 1988, Ser. No. 220,826
Term of patent 14 years
U.S. Cl. D6—511



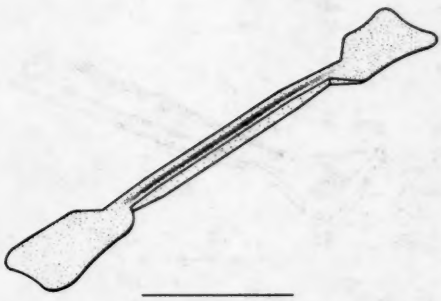
321,301
COMBINED DRINK MIXER AND PITCHER
Emerson J. Purkapile, Chicago, Ill., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Nov. 23, 1988, Ser. No. 275,734
Term of patent 14 years
U.S. Cl. D7—376



321,302
TRAY COVER OR THE LIKE
Larry G. Zimmerman, North Smithfield, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Jan. 23, 1989, Ser. No. 300,678
Term of patent 14 years
U.S. Cl. D7—392.1

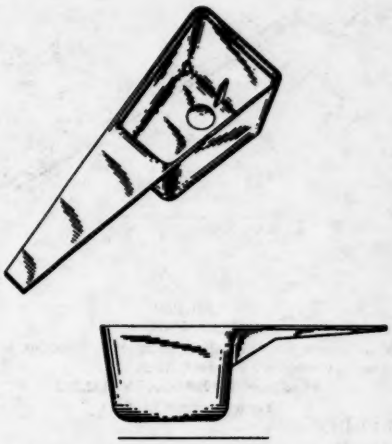


321,303
SCRAPER FOR JARS OF BABY FOOD
Gloria S. Augustino, and Gary R. Augustino, both of 2905 Garfield Pl., Antioch, Calif. 94509
Filed Sep. 21, 1989, Ser. No. 410,229
Term of patent 14 years
U.S. Cl. D7—688

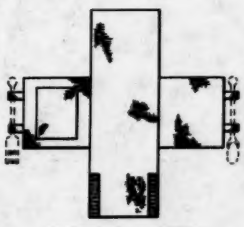


321,304
COMBINED SCOOP AND COVER THEREFOR
Sky Underwood, Brooklyn, N.Y.; Robert Marks, Short Hills, N.J.; David Laubach, New York, N.Y., and Harvey Samo, Maplewood, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Jan. 31, 1990, Ser. No. 473,286
Term of patent 14 years
U.S. Cl. D7—691

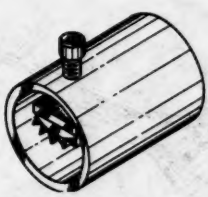
321,305
SCOOP
Sky Underwood, Brooklyn, N.Y.; Robert Marks, Short Hills, N.J.; David Laubach, New York, N.Y., and Harvey Samo, Maplewood, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Dec. 29, 1989, Ser. No. 459,112
Term of patent 14 years
U.S. Cl. D7—691



321,306
CASSEROLE CADDY
Marvin L. Behar, 15022 - 35th Ave. West #2, Lynnwood, Wash. 98037
Filed Feb. 14, 1989, Ser. No. 310,087
Term of patent 14 years
U.S. Cl. D7—607



321,307
LUG NUT REMOVER
Roy L. Breece, P.O. Box 173, Centerville, Tenn. 37033
Filed Mar. 14, 1988, Ser. No. 167,427
Term of patent 14 years
U.S. Cl. D8—14

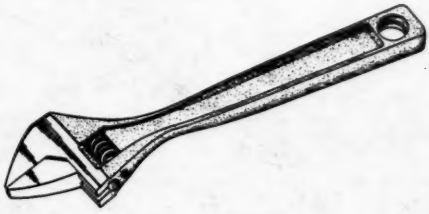


321,308
COMPUTER HOUSING REMOVAL TOOL
Douglas W. Kingsbury, P.O. Box 66754, Houston, Tex. 77266
Filed Oct. 16, 1986, Ser. No. 919,829
Term of patent 14 years
U.S. Cl. D8—14

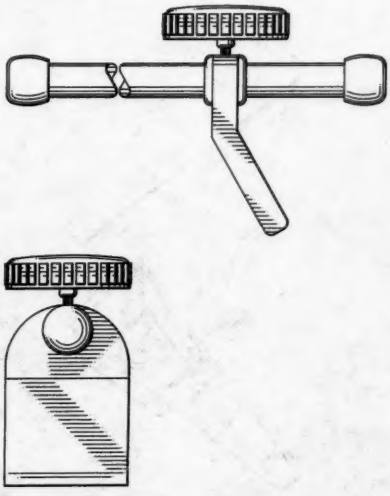
321,309
GREASE GUN
Lyle G. Myers, Fremont, Mich., assignor to LubeCon Maintenance Systems, Inc., Fremont, Mich.
Filed Apr. 3, 1989, Ser. No. 332,223
Term of patent 14 years
U.S. Cl. D15—150

321,310
ADJUSTABLE WRENCH
Masami Toyoshima, Hachioji, Japan, assignor to Top Kogyo Co., Ltd., Niigata, Japan
Filed Mar. 20, 1989, Ser. No. 326,048
Claims priority, application Japan, Dec. 28, 1988, 63-51139
Term of patent 14 years
U.S. Cl. D8—22

321,311
ADJUSTABLE WRENCH
Masami Toyoshima, Hachioji, Japan, assignor to Top Kogyo Co., Ltd., Niigata, Japan
Filed Mar. 20, 1989, Ser. No. 326,049
Claims priority, application Japan, Dec. 28, 1988, 63-51138
Term of patent 14 years
U.S. Cl. D8—22



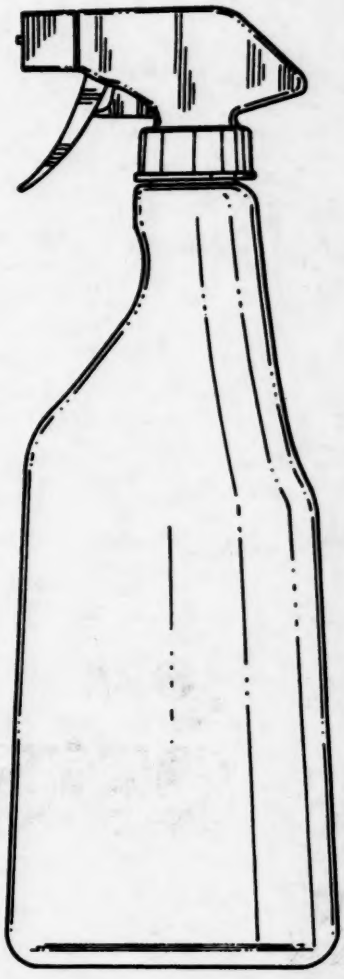
321,312
VEHICLE BRAKE LOCK FOR USE WHILE LOADING OR UNLOADING A BOAT FROM A TRAILER ON AN INCLINE
Bruce L. Williamson, P.O. Box 3601, Richmond, Va. 23235
Filed May 23, 1989, Ser. No. 355,373
Term of patent 14 years
U.S. Cl. D8—339



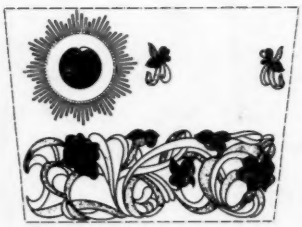
321,313
SUPPORT HOOK
John P. Russell, Centerpoint, and Terry Carroll, Dora, both of Ala., assignors to Infection Control Products, Inc., Gardendale, Ala.
Filed Jul. 31, 1989, Ser. No. 386,682
Term of patent 14 years
U.S. Cl. D8—370

321,314
SUPPORT FOR DECORATIVE STRAND
Lonnie F. Gary, Lubbock, Tex., assignor to Gary Products Group, Inc., Lubbock, Tex.
Filed Jul. 28, 1989, Ser. No. 387,092
The portion of the term of this patent subsequent to May 28, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—373

321,315
COMBINED CONTAINER AND SPRAY NOZZLE
Hans Halm, Herne, and Paul-Otto Weltgen, Hilden, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Aug. 25, 1988, Ser. No. 236,688
Claims priority, application World Int. Prop. O., Feb. 25, 1988, DM/010364
Term of patent 14 years
U.S. Cl. D9—300

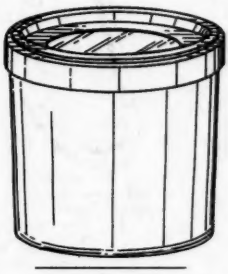


321,316
SURFACE ORNAMENTATION FOR A BOTTLE
Franco Alberti, Benevento BN, Italy, assignor to S.P.A. Strega Alberti Benevanto (S.A.B.), Benevento BN, Italy
Filed Nov. 13, 1989, Ser. No. 433,708
Term of patent 14 years
U.S. Cl. D9—307

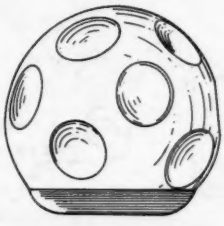


321,317
COMBINED CONTAINER AND DISPENSER
Adam Sherman, Brooklyn, N.Y., and Peter Stagl, Morris Plains, N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.
Filed Jan. 2, 1990, Ser. No. 460,220
Term of patent 14 years
U.S. Cl. D9—337

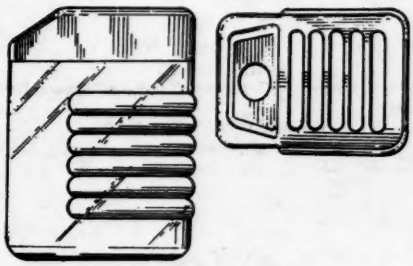
321,318
CONTAINER
Harvey R. Gunter, Bridge City, Tex., assignor to Cardinal Packaging, Inc., Streetsboro, Ohio
Filed Apr. 14, 1988, Ser. No. 182,071
Term of patent 14 years
U.S. Cl. D9—352



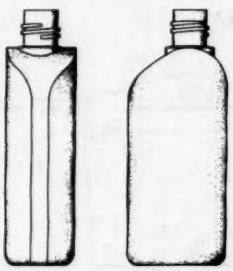
321,319
CONTAINER FOR DISPENSING LIQUID CLEANSING AGENTS OR SIMILAR ARTICLE
Orlandi Giuseppe, Milan, Italy, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Dec. 27, 1988, Ser. No. 291,912
Claims priority, application Italy, Jun. 28, 1988, 21502 B/88
Term of patent 14 years
U.S. Cl. D9—366



321,320
LIQUID DETERGENT DISPENSER WITH LID OR SIMILAR ARTICLE
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Apr. 18, 1989, Ser. No. 340,314
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, DMA000856
Term of patent 14 years
U.S. Cl. D9—366

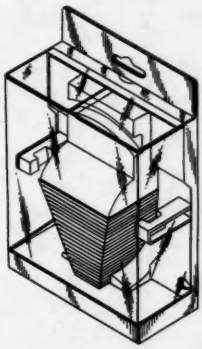


321,321
BOTTLE
Frank R. Wilgus, Powell, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 19, 1990, Ser. No. 467,606
Term of patent 14 years
U.S. Cl. D9—375

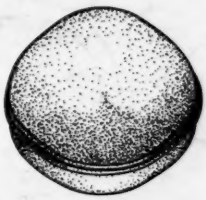


321,322
BOTTLE
Paul D. Fuchs, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Feb. 14, 1990, Ser. No. 479,885
Term of patent 14 years
U.S. Cl. D9—375

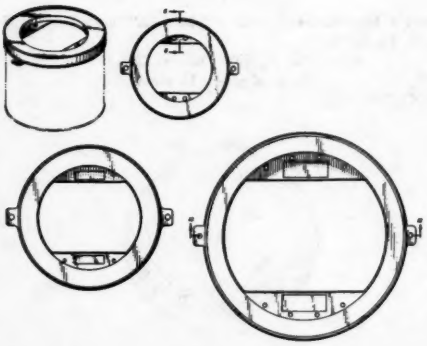
321,323
PACKING BOX FOR HEADPHONE
Yuhko Nakamura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 19, 1989, Ser. No. 452,327
Claims priority, application Japan, Jun. 28, 1989, 1-23901
Term of patent 14 years
U.S. Cl. D9—415



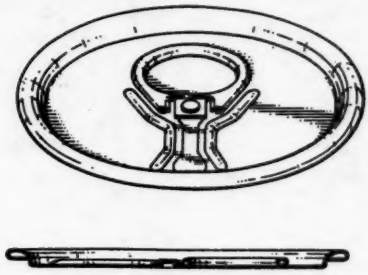
321,324
CONTAINER
Dennis J. Budzbanowski, R.D. #5, Box 232 Nancy Dr., Meadville, Pa. 16335
Filed May 30, 1989, Ser. No. 358,199
Term of patent 14 years
U.S. Cl. D9—425



321,325
PAINT CAN RIM PROTECTOR
R. Peter Petrus, P.O. Box 533, Liverpool, N.Y. 13088
Filed Jul. 18, 1988, Ser. No. 220,816
Term of patent 14 years
U.S. Cl. D9—435

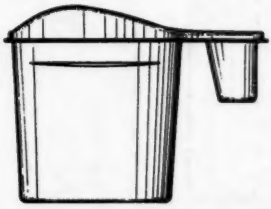


321,326
END PANEL FOR CANS
Robert M. Harwood, West Glamorgan, Scotland, assignor to CMB Foodcan plc, England
Filed Jan. 27, 1989, Ser. No. 303,777
Claims priority, application United Kingdom, Jul. 29, 1988, 1052675
Term of patent 14 years
U.S. Cl. D9—438



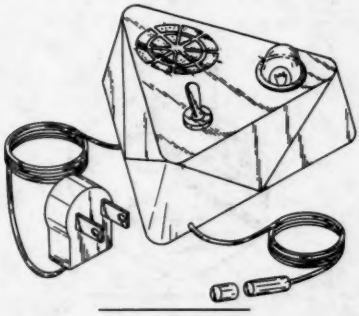
321,327
WRIST WATCH
Daniel S. O'Connell, 5423-H Spanish Oak La., Agoura, Calif. 91301
Filed Jan. 8, 1990, Ser. No. 461,789
Term of patent 14 years
U.S. Cl. D10—33

321,328
MEASURING CUP
Jacky P. Duquet, Herbeville, France, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Nov. 17, 1988, Ser. No. 272,653
Claims priority, application France, May 17, 1988, 883222
Term of patent 14 years
U.S. Cl. D10—46.2



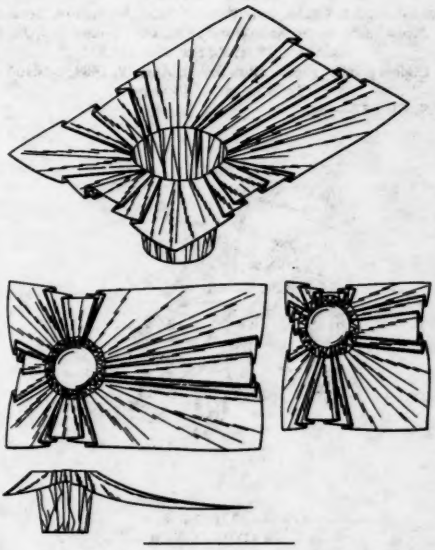
321,329
ELECTRONIC LOCATING TRANSMITTER FOR LOST CHILDREN OR THE LIKE
Burton W. Barnett, and Mary Barnett, both of 1111 Lane Ave., Titusville, Fla. 32780-3908
Filed May 4, 1989, Ser. No. 347,281
Term of patent 14 years
U.S. Cl. D10—104

321,330
ALARM FOR PATIENTS IN HOSPITALS OR THE LIKE
Robert E. Gagnon, 31 Conlon Street, Winnipeg, Manitoba, Canada R2C-4K6, and Raymond Gagnon, 51 Sandrington Dr., Winnipeg, Manitoba, Canada R2N-2J2
Filed Jul. 13, 1989, Ser. No. 379,151
Term of patent 14 years
U.S. Cl. D10—106

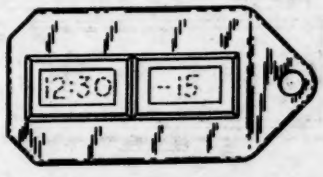


321,331
EARRINGS
Christine Royer, New York, N.Y., assignor to Halston Enterprises, Inc., New York, N.Y.
Filed Jun. 1, 1989, Ser. No. 360,163
Term of patent 14 years
U.S. Cl. D11—43

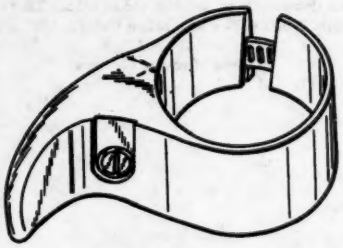
321,332
FLOWER POT COVER
Donald E. Weder; Erwin Weder, deceased, both of Highland, Ill. by Donald E. Weder and Wanda M. Weder, co-executors; Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Oct. 13, 1987, Ser. No. 108,351
Term of patent 14 years
U.S. Cl. D11—164



321,333
PULL TAB FOR SLIDE FASTENERS
Scott T. Soule, 90 Main St., Fryeburg, Me. 04037
Filed Feb. 26, 1988, Ser. No. 162,352
Term of patent 14 years
U.S. Cl. D11—221

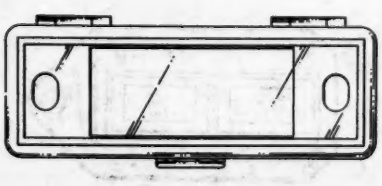


321,334
BICYCLE DRIVE CHAIN GUIDE
John W. Greenlaw, 4120 Morgan Territory Rd., Clayton, Calif. 94517
Filed Dec. 14, 1989, Ser. No. 450,843
Term of patent 14 years
U.S. Cl. D12—114



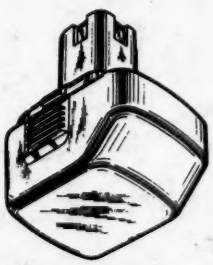
321,335
WHEEL CHAIR
Takaaki Aoki, Osaka, and Fumiko Sato, Kanagawa, both of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan
Filed Oct. 19, 1989, Ser. No. 424,371
Claims priority, application Japan, Apr. 28, 1989, 1-16106
Term of patent 14 years
U.S. Cl. D12—131

321,336
RADIO COVER
Fred O. Hoese, Bulverde, Tex., assignor to Hoese Corporation, Bulverde, Tex.
Filed May 8, 1989, Ser. No. 349,338
Term of patent 14 years
U.S. Cl. D12—192

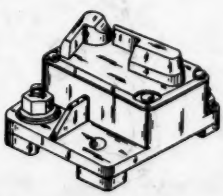


321,337
BATTERY CHARGER
Masakazu Sakamoto; Naoki Kikuchi, both of Tokyo, and Noboru Nakanishi, Hiroshima, all of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Dec. 1, 1989, Ser. No. 444,332
Claims priority, application Japan, Jun. 2, 1989, 1-20587
Term of patent 14 years
U.S. Cl. D13—108

321,338
STORAGE BATTERY FOR ELECTRIC TOOLS
Masakazu Sakamoto; Naoki Kikuchi, both of Tokyo, and Noboru Nakanishi, Hiroshima, all of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Nov. 30, 1989, Ser. No. 443,410
Claims priority, application Japan, Jun. 2, 1989, 1-20588
Term of patent 14 years
U.S. Cl. D13—108

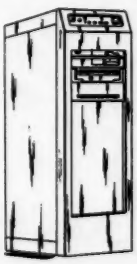


321,339
FIREWALL MOUNT HIGH AMP CIRCUIT BREAKER
Thomas J. Stack, Chicago, and Jacek M. Korczynski, Niles, both of Ill., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Sep. 28, 1989, Ser. No. 414,182
Term of patent 14 years
U.S. Cl. D13—160

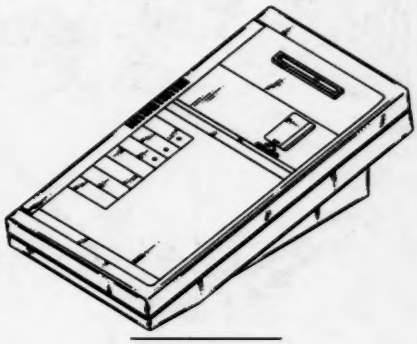


321,340
DATA INPUT/OUTPUT TERMINAL FOR MONITORING PATIENTS
Dino M. Savio, Clearwater, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 15, 1988, Ser. No. 271,480
Term of patent 14 years
U.S. Cl. D14—100

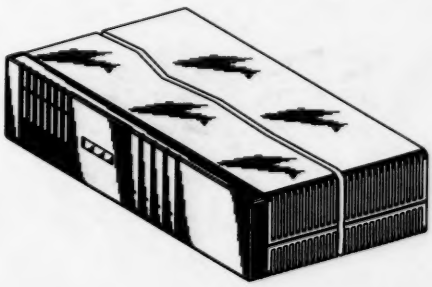
321,341
COMPUTER HOUSING
Anh Bao, Orange, and Yu-Zong Lin, Fountain Valley, both of Calif., assignors to CSS Laboratories, Inc., Irvine, Calif.
Filed Jun. 2, 1989, Ser. No. 360,751
Term of patent 14 years
U.S. Cl. D14—102



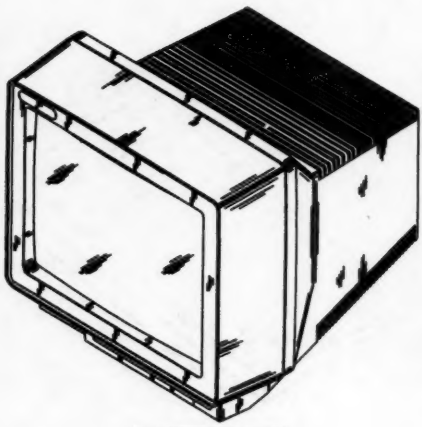
321,342
HOUSING FOR MAGNETIC STRIP READER OR SIMILAR ARTICLE
Volker Diehl, Neuweiler, and Günter Kuczewski, Denkendorf, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 25, 1989, Ser. No. 302,537
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1988, M 88 00 620.4
Term of patent 14 years
U.S. Cl. D14—107



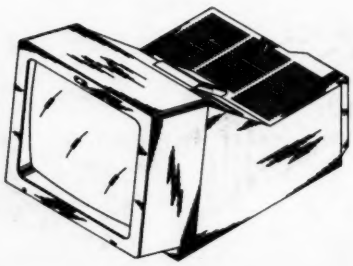
321,343
MODEM FOR DIGITAL COMMUNICATIONS
David L. Feer, Medina, Ohio, and Daniel L. Williams, Norwood, Mass., assignors to Codex Corporation, Mansfield, Mass.
Filed Dec. 22, 1989, Ser. No. 455,119
Term of patent 14 years
U.S. Cl. D14—107



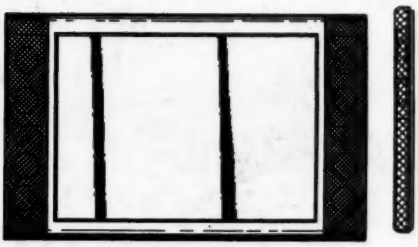
321,344
COMPUTER DISPLAY
Robert E. Steinbugler, Raleigh, N.C.; Richard Sapper, Montagnola, Switzerland; Timothy D. Wetzel, Santa Clara, Calif., and Roger C. Williams, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 7, 1989, Ser. No. 390,261
Term of patent 14 years
U.S. Cl. D14—113



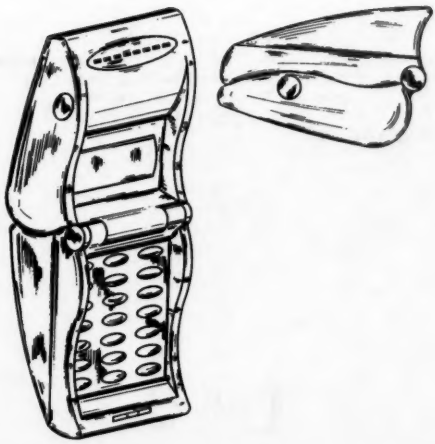
321,345
COMPUTER CRT MONITOR
Larry S. Foster, Lexington, Ky.; Richard F. Sapper, Montagnola, Switzerland; Steven A. Silverstein, and James P. Wang, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 11, 1989, Ser. No. 419,855
Term of patent 14 years
U.S. Cl. D14—113



321,346
COMBINED PROJECTION SCREEN AND SPEAKERS
Masakazu Sugiyama, Woodcliff Lake, N.J., assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 5, 1989, Ser. No. 446,164
Term of patent 14 years
U.S. Cl. D14—129



321,347
PORTABLE CELLULAR HANDSET TELEPHONE
Tony Colida, 2672 Bedford Road, Montréal, Québec, Canada H3S-1G1
Filed Apr. 23, 1990, Ser. No. 513,165
Term of patent 14 years
U.S. Cl. D14—138



321,348

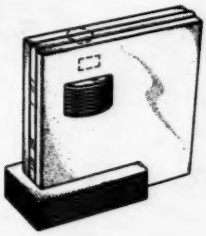
TELEPHONE ANSWERING INSTRUMENT

Daniel K. Harden, San Jose, Calif., and John B. Havener, Fountaintown, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 14, 1990, Ser. No. 583,769

Term of patent 14 years

U.S. Cl. D14—141



321,349

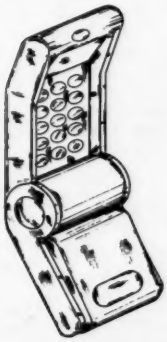
CELLULAR PORTABLE HANDSET TELEPHONE

Tony Colida, 2672 Bedford Rd., Montreal, Quebec, Canada H3S-1G1

Filed May 10, 1990, Ser. No. 521,660

Term of patent 14 years

U.S. Cl. D14—138



321,350

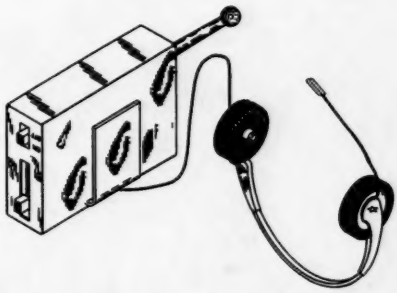
REMOTE RADIOTELEPHONE HEADSET

Patrick G. Phelan, 2044 Shore Road, R.R. 3, Eastern Passage, Nova Scotia, Canada B3G-1H5

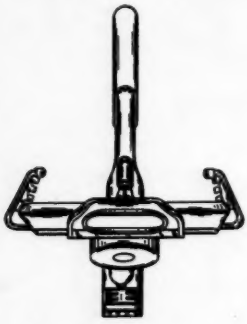
Filed Jun. 15, 1990, Ser. No. 538,477

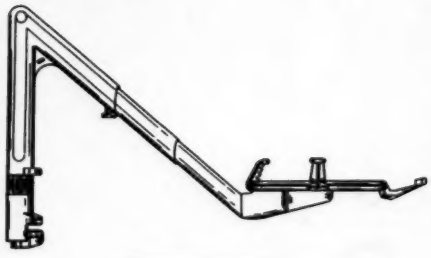
Term of patent 14 years

U.S. Cl. D14—223

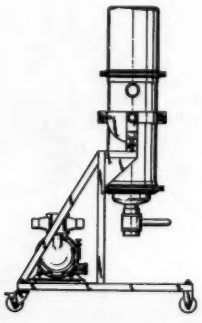


321,351
PIVOTABLE TELEPHONE STAND
Balthasar Kirchner, Eferding, Austria, assignor to Ernst Stadelmann Gesellschaft m.b.H., Eferding, Austria
Filed Mar. 7, 1990, Ser. No. 490,131
Claims priority, application Austria, Sep. 8, 1989, 27630
Term of patent 14 years
U.S. Cl. D14—251

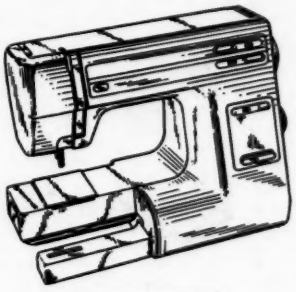




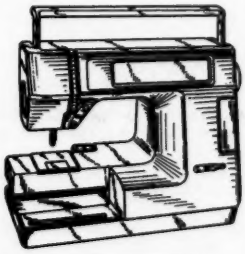
321,352
MOBILE IN-LINE STRAINER FOR PAINTS AND RESINS OR THE LIKE
Nicholas R. Vann, Sunbury-on-Thames, United Kingdom, assignor to Russell Finex Limited, London, United Kingdom
Filed Oct. 12, 1988, Ser. No. 257,024
Term of patent 14 years
U.S. Cl. D15—7



321,353
SEWING MACHINE
Yoshiaki Eguchi, and Nobufusa Kuroki, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Dec. 27, 1989, Ser. No. 457,539
Term of patent 14 years
U.S. Cl. D15—69



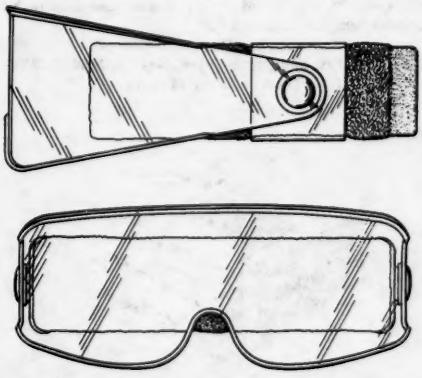
321,354
SEWING MACHINE
Nobufusa Kuroki, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Oct. 27, 1989, Ser. No. 428,320
Claims priority, application Japan, Feb. 23, 1989, 1-32360
Term of patent 14 years
U.S. Cl. D15—70



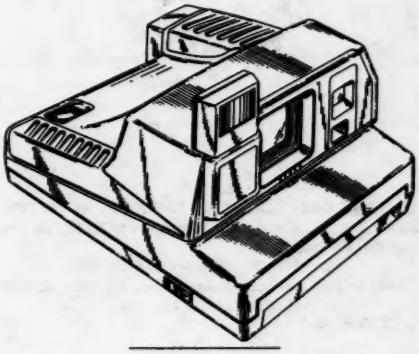
321,355
COMBINED EYEGLASSES AND SHIELDING CASSETTE THEREFOR
Stephan C. Allendorf, Hoboken, N.J., and Thomas M. Dair, Valley Cottage, N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Nov. 22, 1989, Ser. No. 440,294
Term of patent 14 years
U.S. Cl. D16—102

321,356
SPECTACLE FRAMES
Jean-Michel Daubignard, Villiers sur Marne; Pascal Pauly, Amilly, and Philippe Pora, Lognes, all of France, assignors to Essilor International (Compagnie Generale D'Optique), Creteil, France
Filed Oct. 30, 1989, Ser. No. 431,313
Claims priority, application France, Apr. 28, 1989, 892928
Term of patent 14 years
U.S. Cl. D16—102

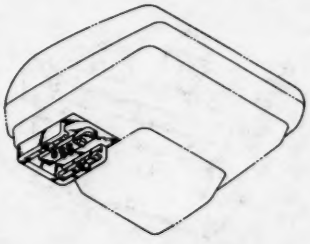
321,357
SUN VISOR
Robyn Karp, 102 Stratford Rd., Harrison, N.Y. 10528
Filed May 25, 1989, Ser. No. 357,582
Term of patent 14 years
U.S. Cl. D16—107



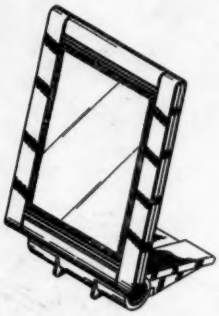
321,358
POP-UP STROBE CAMERA OR SIMILAR ARTICLE
John H. Betts, New York, N.Y., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Mar. 14, 1988, Ser. No. 167,430
The portion of the term of this patent subsequent to Sep. 17, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—211



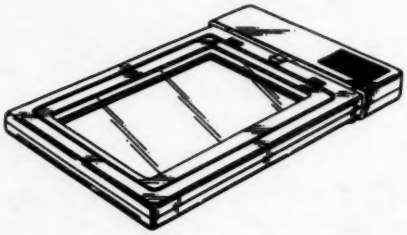
321,359
MOUNTING MEMBER FOR A CAMERA ACCESSORY
Tatsuro Izumi, and Makoto Yanai, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Sep. 22, 1988, Ser. No. 247,926
Claims priority, application Japan, Aug. 24, 1988, 63-33651; Aug. 24, 1988, 63-33652
Term of patent 14 years
U.S. Cl. D16—219



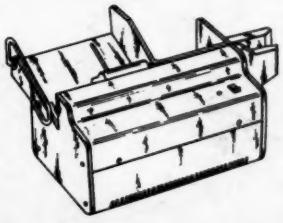
321,360
FOLDABLE ADVERTISEMENT SLIDE PROJECTOR
Billy Cheng, Taipei, Taiwan, assignor to Easterntec, Inc., Taipei, Taiwan
Filed Jul. 7, 1989, Ser. No. 376,406
Term of patent 14 years
U.S. Cl. D16—229



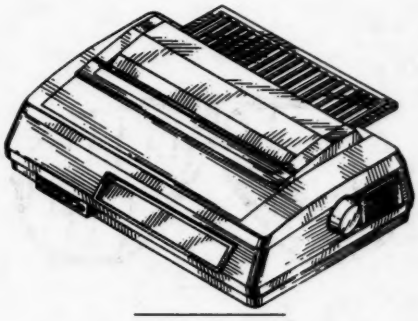
321,361
DISPLAY UNIT FOR AN OVERHEAD PROJECTOR
Masaaki Iino, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 24, 1989, Ser. No. 315,039
Claims priority, application Japan, Sep. 13, 1988, 63-35997
Term of patent 14 years
U.S. Cl. D16—235



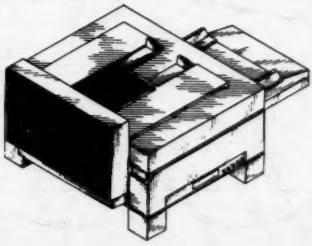
321,362
DOCUMENT FEEDER
Emilio B. Martin, Madrid, Spain, assignor to Amper, S.A., Madrid, Spain
Filed Jun. 2, 1989, Ser. No. 360,757
Term of patent 14 years
U.S. Cl. D18—49



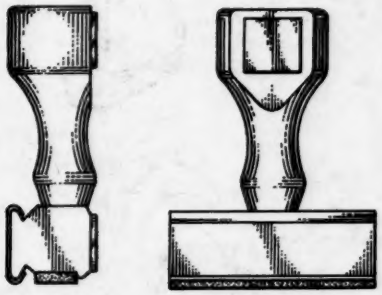
321,363
COMPUTER OUTPUT PRINTER
Takashi Hirose; Yoshihiro Kasahara, and Yukio Terauchi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Feb. 9, 1990, Ser. No. 478,174
Claims priority, application Japan, Aug. 11, 1989, 1-29594
Term of patent 14 years
U.S. Cl. D18—54



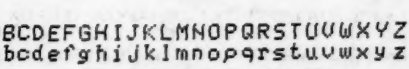
321,364
COMPUTER OUTPUT PRINTER
Masayoshi Eto; Hiroshi Hidaka; Friedrich K. Frenkler, and Norikatsu Morita, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Mar. 9, 1990, Ser. No. 494,003
Claims priority, application Japan, Sep. 11, 1989, 1-33387
Term of patent 14 years
U.S. Cl. D18—55



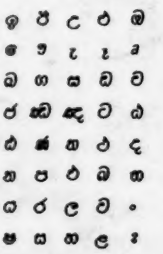
321,365
COMBINED HAND STAMP AND MAGNETIC STRIP ATTACHMENT
Charles R. Bostick, 833 W. 11th St., San Pedro, Calif. 90731
Filed Sep. 18, 1989, Ser. No. 408,320
Term of patent 14 years
U.S. Cl. D18—15



321,366
CURVED FONT
Peter N. Yianilos, Fort Lauderdale, Fla., assignor to Franklin Electronic Publishers, Incorporated, Mt. Holly, N.J.
Filed Jun. 16, 1989, Ser. No. 367,219
Term of patent 14 years
U.S. Cl. D18—24

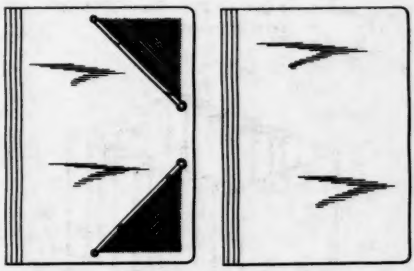


321,367
ITALIC SINHALESE FONT
Sisira Ranasinghe, 2002 Beechmont Dr., Fort Wayne, Ind. 46825
Filed Sep. 7, 1988, Ser. No. 241,550
The portion of the term of this patent subsequent to Sep. 10, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—25



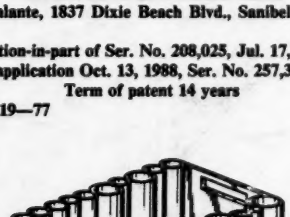
321,368
PAPER TRIMMER WITH STORAGE COMPARTMENTS FOR OFFICE SUPPLIES
Steven J. Beno, c/o Ideal School Supply Corporation, 2245 Delany Rd., Waukegan, Ill. 60087
Filed Mar. 22, 1989, Ser. No. 327,157
Term of patent 14 years
U.S. Cl. D18—34

321,369
STATIONERY FOLDER OR THE LIKE
Tracey Tooker, 18 Mercer St., New York, N.Y. 10013
Filed Mar. 30, 1988, Ser. No. 175,136
Term of patent 14 years
U.S. Cl. D19—26

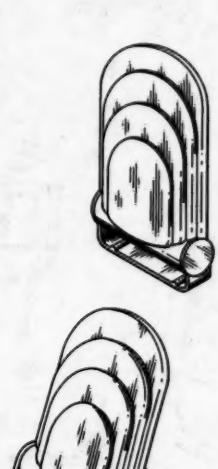


321,370
SIMULATED BASKETBALL PLAYER
Michael Curtis, 911 Skeet Club Rd., High Point, N.C. 27260
Filed Dec. 27, 1988, Ser. No. 289,795
Term of patent 14 years
U.S. Cl. D19—62

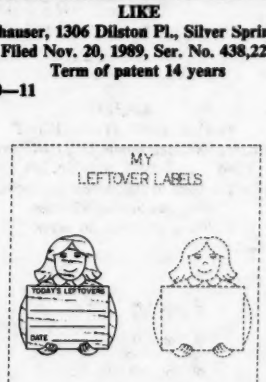
321,371
MULTI-PURPOSE ORGANIZER
Carl J. Galante, 1837 Dixie Beach Blvd., Sanibel Island, Fla. 33957
Continuation-in-part of Ser. No. 208,025, Jul. 17, 1988. This application Oct. 13, 1988, Ser. No. 257,304
Term of patent 14 years
U.S. Cl. D19—77



321,372
MESSAGE HOLDER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed May 30, 1989, Ser. No. 357,250
Term of patent 14 years
U.S. Cl. D19—90



321,373
LABEL FOR REFRIGERATOR CONTAINERS OR THE LIKE
Henry Fankhauser, 1306 Dilston Pl., Silver Spring, Md. 20903
Filed Nov. 20, 1989, Ser. No. 438,227
Term of patent 14 years
U.S. Cl. D20—11



321,374

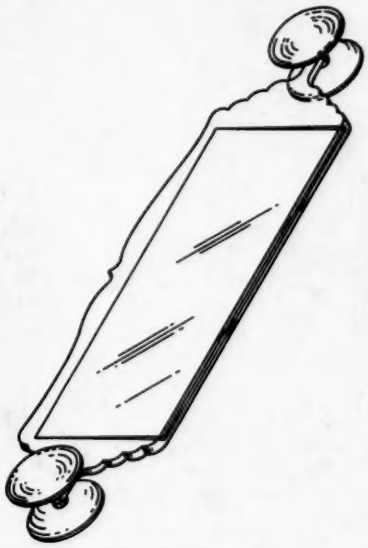
WINDSHIELD STICKER HOLDER

Van Whitlock, and Shirley Whitlock, both of 811 Forest Green Dr., Corapolis, Pa. 15108

Filed May 25, 1989, Ser. No. 356,397

Term of patent 14 years

U.S. Cl. D20—42



321,375

HOUSING FOR ELECTRONIC GAME OR THE LIKE

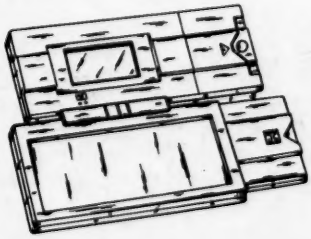
Chi-Kit Leung, Tai Koo Shing, Hong Kong, assignor to Video Technology Industries, Inc., Wheeling, Ill.

Filed Mar. 21, 1989, Ser. No. 326,267

Claims priority, application United Kingdom, Oct. 27, 1988, 1054580

Term of patent 14 years

U.S. Cl. D21—13



321,376

HOUSING FOR ELECTRONIC GAME OR THE LIKE

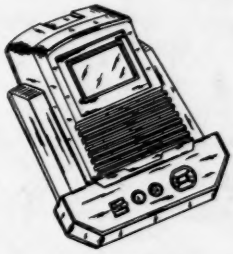
Chi-Kit Leung, Tai Koo Shing, Hong Kong, assignor to Video Technologies Industries, Inc., Wheeling, Ill.

Filed Mar. 21, 1989, Ser. No. 326,268

Claims priority, application United Kingdom, Oct. 27, 1988, 1,054,581

Term of patent 14 years

U.S. Cl. D21—13



321,377

HOUSING FOR ELECTRONIC GAME OR THE LIKE

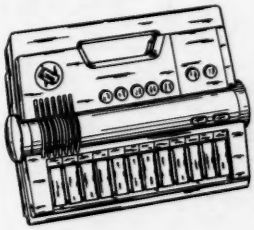
Man-Ho Ko, Kowloon, Hong Kong, assignor to Video Technology Industries, Inc., Wheeling, Ill.

Filed Mar. 21, 1989, Ser. No. 326,269

Claims priority, application United Kingdom, Oct. 27, 1988, 1054579

Term of patent 14 years

U.S. Cl. D21—13



321,378

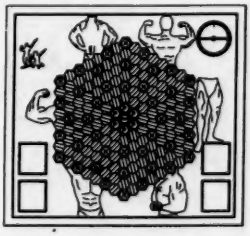
GAME BOARD

Joseph T. Taormina, San Diego, Calif., and Lyndon K. Murray, Flagstaff, Ariz., assignors to Taormina & Murray Productions, San Diego, Calif.

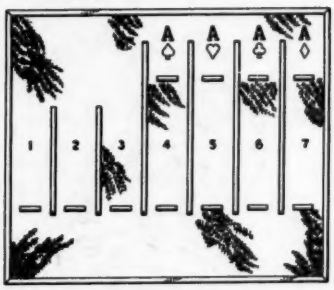
Filed Aug. 14, 1989, Ser. No. 393,319

Term of patent 14 years

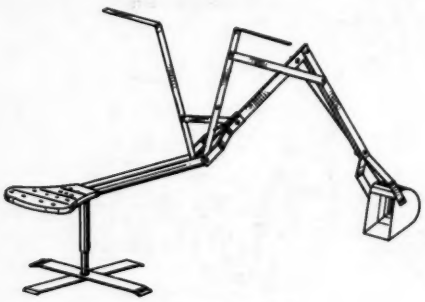
U.S. Cl. D21—30



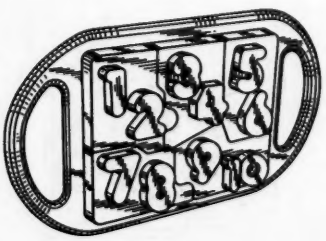
321,379
SOLITAIRE PLAYING BOARD
Ronald C. Brown, 15707 W. 128th St., Olathe, Kans. 66062
Filed May 4, 1989, Ser. No. 347,236
Term of patent 14 years
U.S. Cl. D21—57



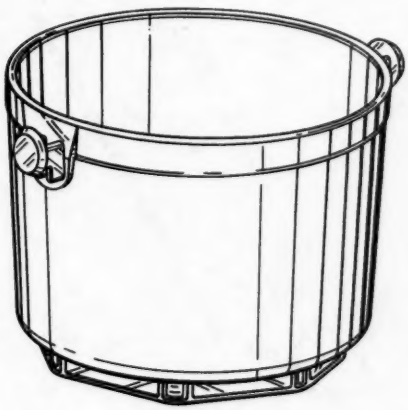
321,380
SANDBOX BACKHOE TOY
Gilbert A. Dewing, R. #1, Box 1630, Enosburg Falls, Vt. 05450
Filed Sep. 29, 1989, Ser. No. 414,432
Term of patent 14 years
U.S. Cl. D21—71



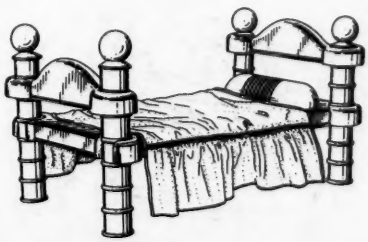
321,381
TOY PUZZLE
Nancy D. Slayton, Cumberland, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Jul. 31, 1989, Ser. No. 387,686
Term of patent 14 years
U.S. Cl. D21—105



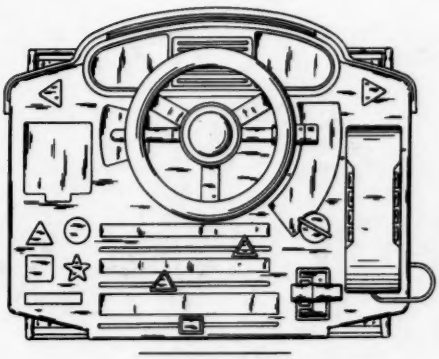
321,382
SAND PAIL TOY OR THE LIKE
Douglas M. Laib, Blackstone, Mass., and Patrick W. Brown, North Olmsted, Ohio, assignors to Dart Industries Inc., Deerfield, Ill.
Filed Mar. 3, 1989, Ser. No. 319,508
Term of patent 14 years
U.S. Cl. D21—120



321,383
TOY BED
Alain Monneret, Voiteur, France, assignor to Monneret Jouets, Lons Le Saunier, France
Filed Jul. 21, 1989, Ser. No. 382,837
Claims priority, application World Int. Prop. O., Feb. 8, 1989, DM/012788
Term of patent 14 years
U.S. Cl. D21—123

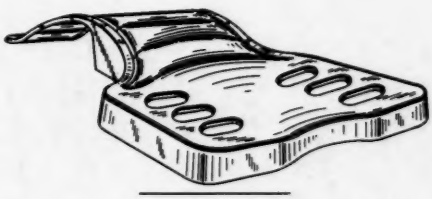


321,384
ELECTRONIC DRIVING TOY
David T. Cheung, New Territories, and Thomas M. Ko, Kowloon, both of Hong Kong, assignors to Video Technology Industries, Inc., Wheeling, Ill.
Filed May 3, 1989, Ser. No. 346,818
Claims priority, application United Kingdom, Nov. 15, 1988, 1054997
Term of patent 14 years
U.S. Cl. D21—142

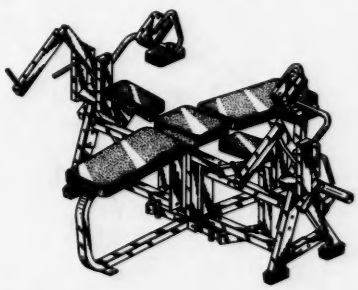


321,385
STUFFED DINOSAUR ANIMAL FIGURE
Kimberly Hudson, Henderson, Nev., assignor to Kid's Biz, Inc., San Diego, Calif.
Filed May 2, 1989, Ser. No. 346,616
Term of patent 14 years
U.S. Cl. D21—148

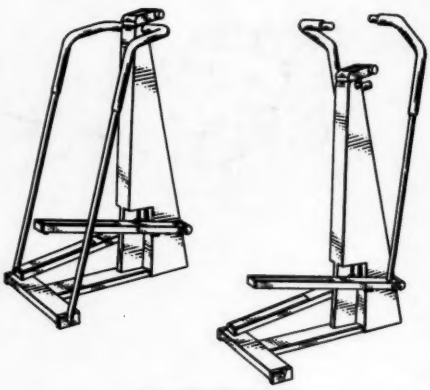
321,386
SUPPORT FOR SIT-UP EXERCISE OR SIMILAR ARTICLE
Richard Reichman, Jamison, Pa., assignor to Dynamic Classics, Ltd., New York, N.Y.
Filed May 24, 1989, Ser. No. 356,923
Term of patent 14 years
U.S. Cl. D21—191



321,387
ISOLATERAL SHOULDER CUFF PHYSICAL EXERCISER
Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation, Cincinnati, Ohio
Filed Sep. 19, 1989, Ser. No. 409,167
Term of patent 14 years
U.S. Cl. D21—195

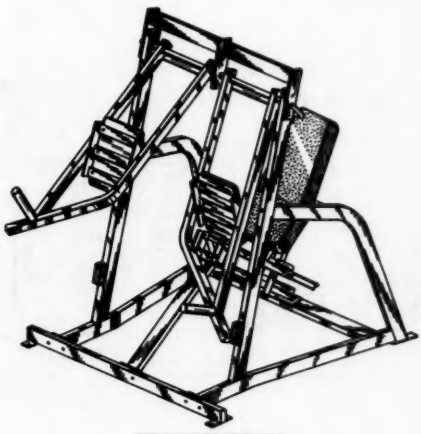


321,388
STEPPING EXERCISE MACHINE
William T. Dalebout, Logan, Utah, assignor to Proform Fitness Products, Inc., Logan, Utah
Filed Nov. 6, 1989, Ser. No. 432,145
Term of patent 14 years
U.S. Cl. D21—195

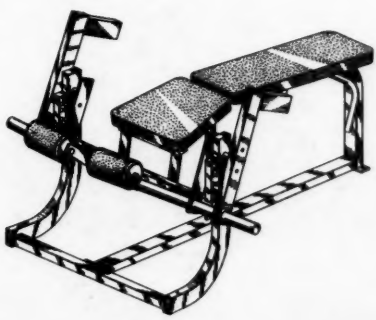


321,389
LEG EXTENSION PHYSICAL EXERCISER
Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation, Cincinnati, Ohio
Filed Dec. 15, 1989, Ser. No. 451,354
Term of patent 14 years
U.S. Cl. D21—195

321,390
LEG PRESS PHYSICAL EXERCISER
Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation, Cincinnati, Ohio
Filed Dec. 15, 1989, Ser. No. 451,355
Term of patent 14 years
U.S. Cl. D21—195



321,391
LEG CURL PHYSICAL EXERCISER
Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation, Cincinnati, Ohio
Filed Dec. 15, 1989, Ser. No. 452,311
Term of patent 14 years
U.S. Cl. D21—195



321,392

COMBINED BASKETBALL GOAL, HEIGHT MEASURER AND CLOTHESHORSE OR THE LIKE

Darco Chen, No. 16, Chung Cheng 3rd Rd., Pu Li Chen, Nan Tou Hsien, Taiwan

Filed Apr. 24, 1989, Ser. No. 342,428

Term of patent 14 years

U.S. Cl. D21—201

321,393

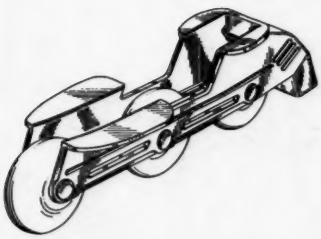
SLOTTED ROLLER SKATE

Brennan J. Olson, Minneapolis, Minn., and Charles R. Frigard, Holland, Mich., assignors to Rollerblade, Inc., Minnetonka, Minn.

Filed Aug. 23, 1989, Ser. No. 397,305

Term of patent 14 years

U.S. Cl. D21—226



321,394

QUICK-CHANGE FILTER CARTRIDGE

Raymond M. Petrucci, Middlebury; Bruce G. Taylor, Kensington; Edward C. Giordano, Manchester, all of Conn.; James M. Padilla, Covina Heights, and Carl Palmer, La Habra Heights, both of Calif., assignors to Cuno, Incorporate, Meriden, Conn.

Filed Nov. 27, 1989, Ser. No. 412,874

Term of patent 14 years

U.S. Cl. D23—209

321,395

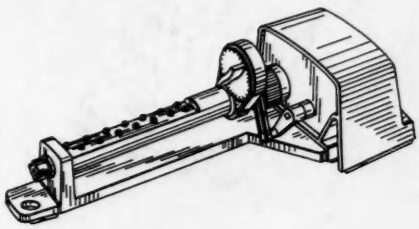
OSCILLATING SPRINKLER

Stephen P. Whitehead, Elgin, Ill., assignor to Suncast Corporation, Batavia, Ill.

Filed Jul. 19, 1990, Ser. No. 555,743

Term of patent 14 years

U.S. Cl. D23—216



321,396

OSCILLATING SPRINKLER

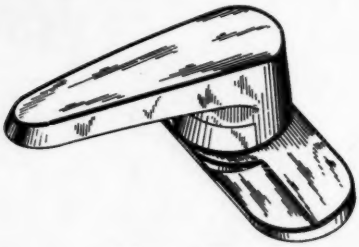
Stephen P. Whitehead, Elgin, Ill., assignor to Suncast Corporation, Batavia, Ill.

Filed Jul. 19, 1990, Ser. No. 555,993

Term of patent 14 years

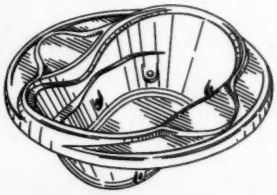
U.S. Cl. D23—216

321,397
FAUCET
Todd D. Dannenberg, Sheboygan, Wis. 53081, assignor to Kohler Co., Kohler, Wis.
Filed Nov. 14, 1988, Ser. No. 271,194
Term of patent 14 years
U.S. Cl. D23—238

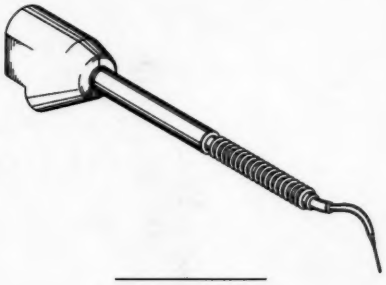


321,398
FAUCET
Gerhard E. Joerger, Seckenheimer Landstrasse 270-280, 6800 Mannheim 25, Fed. Rep. of Germany
Filed Mar. 10, 1988, Ser. No. 166,844
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 1364
Term of patent 14 years
U.S. Cl. D23—241

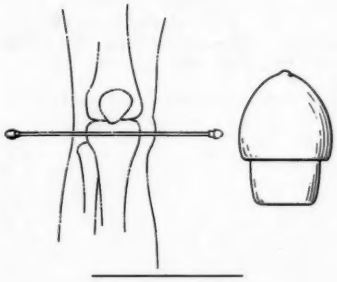
321,399
BATH TUB
Joseph Primucci; Vello Hubel, and Alexander M. Gardiner, all of Toronto, Canada, assignors to Mirolin Industries Inc., Toronto, Canada
Filed May 31, 1989, Ser. No. 359,434
Term of patent 14 years
U.S. Cl. D23—277



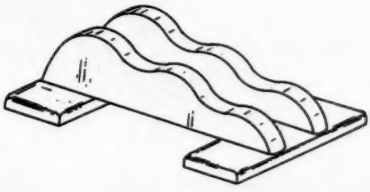
321,400
PERIODONTAL PROBE
Ralph A. Beckman; Henry D. Sharpe, III, both of Providence; Len Curado, East Greenwich, and James W. Barfoot, Providence, all of R.I., assignors to Bausch & Lomb Professional Dental Products, Inc., Rochester, N.Y.
Continuation of Ser. No. 315,131, Feb. 24, 1989, Pat. No. 4,995,403. This application Apr. 9, 1990, Ser. No. 506,706
Term of patent 14 years
U.S. Cl. D24—140



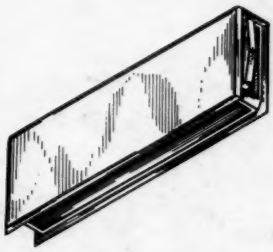
321,401
SURGICAL PIN TIP
Timothy M. Scanlan, St. Paul, and Kenneth R. Blake, Brooklyn Park, both of Minn., assignors to Scanlan International, Inc., St. Paul, Minn.
Filed Dec. 27, 1988, Ser. No. 289,798
Term of patent 14 years
U.S. Cl. D24—147



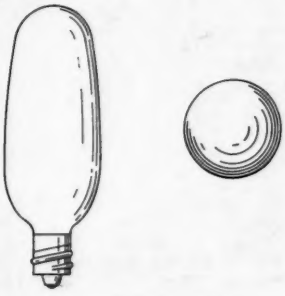
321,402
SPINAL THERAPY BOARD
Tomezo Hoshino, Ft. Lauderdale, Fla., assignor to Hoshino Health Products, Inc., Fort Lauderdale, Fla.
Filed Mar. 20, 1989, Ser. No. 325,479
Term of patent 14 years
U.S. Cl. D24—188



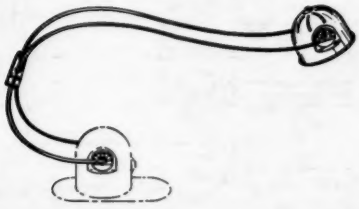
321,403
WINDOW SASH TAKEOUT COVER
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 19, 1988, Ser. No. 246,526
Term of patent 14 years
U.S. Cl. D25—52



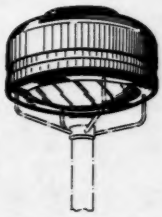
321,404
LIGHT BULB
Jesse R. Falini, West Chester, Pa., assignor to Falburg Films Corporation, West Chester, Pa.
Filed Mar. 29, 1990, Ser. No. 501,629
Term of patent 14 years
U.S. Cl. D26—2



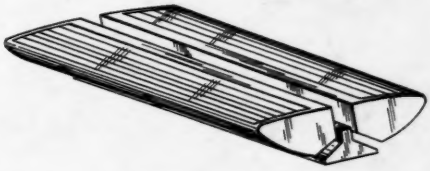
321,405
ADJUSTABLE LAMP
Haim Shwisha, Westport, Conn., assignor to Electrix, Inc., New Haven, Conn.
Filed Sep. 27, 1989, Ser. No. 413,047
Term of patent 14 years
U.S. Cl. D26—65



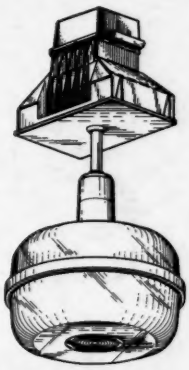
321,406
EXTERIOR LIGHTING FIXTURE
Edwin G. Schlesselman, Cincinnati, Ohio, assignor to LSI Industries Inc., Cincinnati, Ohio
Filed Sep. 13, 1990, Ser. No. 581,873
Term of patent 14 years
U.S. Cl. D26—67



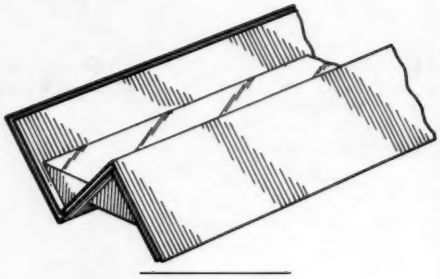
321,407
LUMINAIRE FOR A WALL PARTITION OR THE LIKE
Charles Heidmann, Strasbourg, France, assignor to Steelcase Strafor, Strasbourg, France
Filed Feb. 22, 1989, Ser. No. 314,420
Claims priority, application France, Aug. 30, 1988, 885497
Term of patent 14 years
U.S. Cl. D26—72



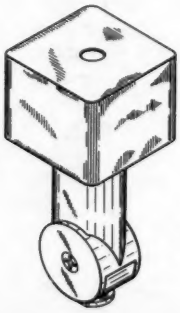
321,408
LUMINAIRE
James S. Hughes, Columbus; Robert L. Ewing, Granville; Herbert A. Fouke, and Bonnie J. Brohard, both of Newark, all of Ohio, assignors to Holophane Company, Inc., Newark, Ohio
Filed Sep. 28, 1987, Ser. No. 101,477
Term of patent 14 years
U.S. Cl. D26—85



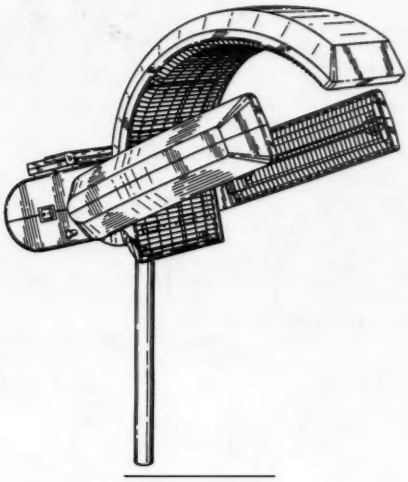
321,409
CEILING LIGHTING FIXTURE
Brigitte Bischof, Kohlstrasse 23, 4920 Lemgo 1, and Horst-Dieter Schmelzer, Forthofstrasse 23, 4815 Schloss Holte-Stukenbrock, both of Fed. Rep. of Germany
Filed Oct. 21, 1988, Ser. No. 260,760
Term of patent 14 years
U.S. Cl. D26—91



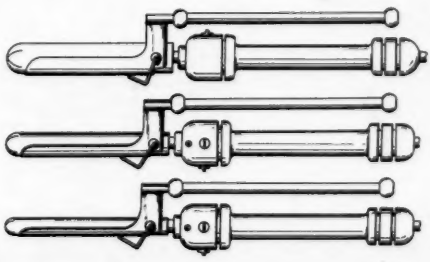
321,410
COMBINED SWIVEL ARM AND CONNECTOR FOR A TRACK LIGHTING FIXTURE
Bruce N. Layne, Wheaton, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Apr. 7, 1989, Ser. No. 334,950
Term of patent 14 years
U.S. Cl. D26—138



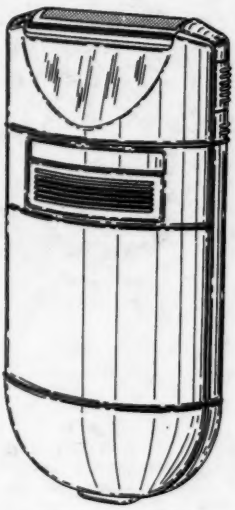
321,411
HAIR DRYER
Reiner Moll, Schwäbisch Gmünd, Fed. Rep. of Germany, assignor to Olymp Karl Herzog GmbH & Co., Stuttgart, Fed. Rep. of Germany
Filed Mar. 5, 1990, Ser. No. 488,751
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 8906255
Term of patent 14 years
U.S. Cl. D28—17



321,412
CURLING IRON
James G. Montagnino; Betty Butzko; Daniel Santhouse; Tim Hanlon, and Steve Power, all of El Paso, Tex., assignors to Helen of Troy, El Paso, Tex.
Filed Jan. 17, 1990, Ser. No. 466,697
Term of patent 14 years
U.S. Cl. D28—35

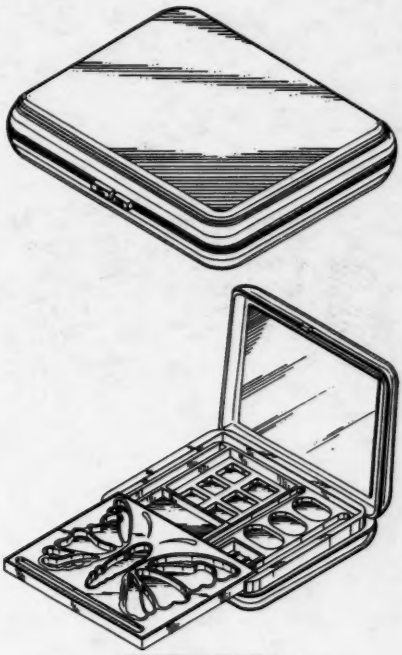


321,413
DRY SHAVER
Marten F. Elkerbout, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 20, 1989, Ser. No. 326,867
Claims priority, application Int'l Pat. Institute, Sep. 28, 1988, DM/001.831
Term of patent 14 years
U.S. Cl. D28—51

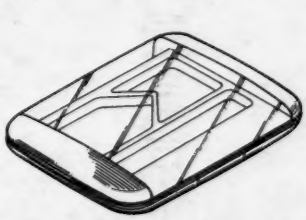


321,414
FINGERNAIL DECAL
Ofelia M. Mullen, 3751 Ida Dr., Columbus, Ga. 31906
Filed Jun. 13, 1988, Ser. No. 205,903
Term of patent 14 years
U.S. Cl. D28—56

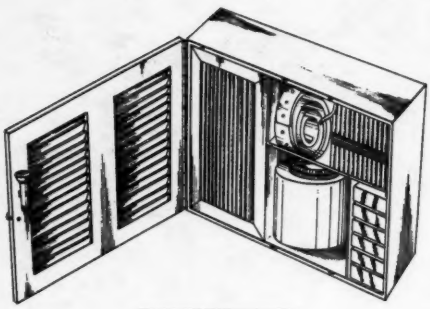
321,415
COSMETIC CASE OR SIMILAR ARTICLE
Fo-Chun Chen, Chang-Hua, Taiwan, assignor to Chuan Hsiang Tang Chemical Co. Ltd., Chang-Hau, Taiwan
Filed Dec. 22, 1989, Ser. No. 454,841
Term of patent 14 years
U.S. Cl. D28—80



321,416
COSMETIC CASE
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Division of Ser. No. 354,425, May 19, 1989. This application Mar. 18, 1991, Ser. No. 670,597
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1988, 8803527[U]
Term of patent 14 years
U.S. Cl. D28—83

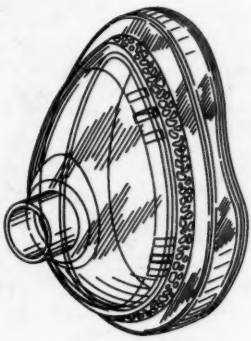


321,417
FIRE SAFETY KIT
Louise J. Flannagan, 4219 Northstrand Dr., Decatur, Ga. 30035
Filed Nov. 27, 1989, Ser. No. 441,418
Term of patent 14 years
U.S. Cl. D29—2

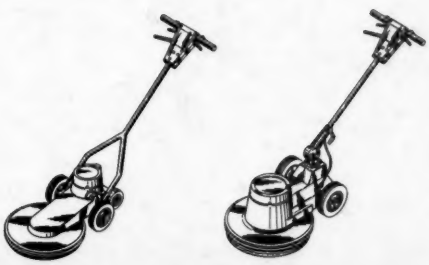


321,418
SQUEEZE BAG RESUSCITATOR
Roger J. Dolida, Overland Park, and Kyle Adriance, Merriam, both of Kans., assignors to Puritan-Bennett Corporation, Lenexa, Kans.
Filed Nov. 3, 1989, Ser. No. 431,629
Term of patent 14 years
U.S. Cl. D29—7

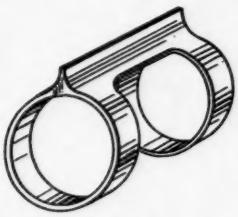
321,419
FACE MASK
Dean R. Wallace, Fort Myers, Fla., assignor to Intertech Resources Inc., Lincolnshire, Ill.
Filed Nov. 9, 1989, Ser. No. 435,290
Term of patent 14 years
U.S. Cl. D29—8



321,420
FLOOR POLISHING MACHINE
Peter W. Von Vett, Englewood, and Eugene L. Bothun, Loveland, both of Colo., assignors to Windsor Industries, Inc., Englewood, Colo.
Filed Feb. 9, 1990, Ser. No. 479,061
Term of patent 14 years
U.S. Cl. D32—15

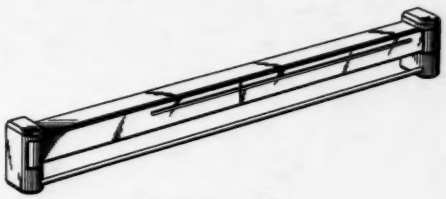


321,421
FINGER-OPERATED SQUEEGEE
Steven Zettle, 1774 NE. Pheasant, Bend, Oreg. 97701
Filed Jan. 23, 1990, Ser. No. 468,958
Term of patent 14 years
U.S. Cl. D32—41

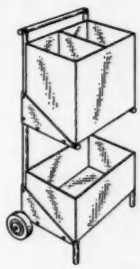


321,422
SCRAPER TO CLEAN THE FINS OF HEAT EXCHANGERS OR THE LIKE
Russell D. Smith, Irvine, Calif., assignor to General Electric Company, Louisville, Ky.
Filed Nov. 2, 1989, Ser. No. 431,012
Term of patent 14 years
U.S. Cl. D32—46

321,423
LAUNDRY DRYING RACK
Heinz J. Ohm, Limburg, Fed. Rep. of Germany, assignor to Leifheit AG, Nassau, Fed. Rep. of Germany
Filed Jul. 7, 1989, Ser. No. 376,863
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1989, 8900375[U]
Term of patent 14 years
U.S. Cl. D32—58



321,424
CART
Kathleen C. Isham, 2610 SE. Ada La., Milwaukie, Oreg. 97267
Filed Mar. 31, 1989, Ser. No. 332,940
Term of patent 14 years
U.S. Cl. D34—21



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TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF NOVEMBER, 1991

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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able logic fuse based on a 6-device SRAM cell for logic arrays. 5,063,537, Cl. 365-96.000.

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—Ramanan, V. R. V.; and Smith, Carl H., 5,062,909, Cl. 148-304.000.

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Rohr, Franz-Josef, 5,063,122, Cl. 429-32.000.

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Bescherer, Robert E.; and Colvin, Barry D., 5,062,390, Cl. 119-72.000.

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Clayton, Jane B.; and Miller, Calvin M., 5,062,684, Cl. 385-27.000.
Crandall, John H.; Davis, Stephen J.; and Reynolds, Brett S., 5,063,564, Cl. 370-110.100.
Diodato, Philip W., 5,063,578, Cl. 377-47.000.
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Hillenius, Steven J.; Lebowitz, Joseph; Liu, Ruichen; and Lynch, William T., 5,063,422, Cl. 357-23.300.
Jewell, Tanya E.; and Rodgers, J. Michael, 5,063,586, Cl. 378-34.000.
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Leonowich, Robert H., 5,063,359, Cl. 331-116.0FE.
Marcuse, Dietrich, 5,063,559, Cl. 359-127.000.
Shapiro, Roy A., 5,063,585, Cl. 379-30.000.
Xie, Ya-Hong, 5,063,569, Cl. 372-45.000.

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Choi, Jae H., 5,063,017, Cl. 264-328.600.

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Bourbon, Pierre; Lagny, Pierre; and Billot, Pierre, 5,063,064, Cl. 424-673.000.

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Petermann, Steven G.; Katahara, Keith W.; and Wolcott, Herbert A., II, 5,063,542, Cl. 367-166.000.

Atlas, Gerard, to Societe Europeenne de Propulsion. Mechanical stabilization system using counter-rotation and a single motor. 5,063,336, Cl. 318-611.000.

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Kloster, John M., 5,062,351, Cl. 98-2.090.

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Fuchs, Jean-Francois; Auberon, Marcel; Odru, Pierre; and Sparks, Charles, 5,062,914, Cl. 156-172.000.

Audeh, Costandi A., to Mobil Oil Corporation. Process for preparing an extreme pressure lubricating oil additive. 5,062,976, Cl. 252-45.000.

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Lenti, Daria; and Visca, Mario, 5,063,092, Cl. 427-393.000.

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Van Erden, Donald L.; McDonald, Daniel P.; and Ausnit, Steven, 5,063,069, Cl. 426-122.000.

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Avey, I. D. Jean. Head protector for use with hard head gear. 5,062,163, Cl. 2-424.000.

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Rossi, Alessandro, 5,063,279, Cl. 219-86.510.

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Tanita, Takeo; Kigami, Hiroyuki; and Azuma, Yusaku, 5,063,334, Cl. 318-568.100.

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Baeck, Andre C.; Busch, Alfred; and Oh, Young S., to Procter & Gamble Co., The. Fabric conditioning compositions: natural hectorite clay and binding and dispersing agent. 5,062,972, Cl. 252-8.800.

Bailey, Thomas F.; and Campbell, John E., to MASX Energy Services Group, Inc. Valve body for oilfield applications. 5,062,450, Cl. 137-533.210.

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Bailly, Jean-Claude A.; and Collomb, Joelle, to BP Chemicals Limited. Composition comprising prepolymer powder and pulverulent inorganic material. 5,063,110, Cl. 428-402.000.

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Parsons, David; Bainbridge, Wilfred N.; Young, Alastair J.; and Temperley, Harry D., 5,062,320, Cl. 74-650.000.

Bair, Clayton H., to United States of America, National Aeronautics and Space Administration. Birefringent filter design. 5,062,694, Cl. 359-498.000.

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Purnell, Charles G.; and Baker, Andrew R., 5,062,908, Cl. 148-332.000.

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Bakermans, Johannes C. W., to AMP Incorporated. Bending tooling for bending flat blanks. 5,062,289, Cl. 72-383.000.

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Concannon, David; Copenhaver, Gary; Bakker, Johan; Vala, John; Banks, Gerald; and Catchpole, Clive, 5,063,599, Cl. 382-7.000.
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Ballance, John W., to British Telecommunications Public Limited Company. Optical communications network. 5,063,595, Cl. 380-48.000.

Ballerstein, John E., to Standard Steel Rail Technology. Tubular welded railing system. 5,062,732, Cl. 403-174.000.

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Nakagaki, Toshio, 5,062,780, Cl. 425-39.000.

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Baranov, Vladimir J.: *See*—
Aleshin, Nikolai P.; Baranov, Vladimir J.; Dolgov, Vyacheslav M.; Yarovoi, Alexandr A.; and Preobrazhensky, Oleg A., 5,062,301, Cl. 73-629.000.

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Michal, Vratislav M.; and Barbaro, Ralph S., 5,062,331, Cl. 83-37.000.

Barbu, Stephane; and Le Pailleur, Laurent, to U.S. Philips Corporation. Delay circuit with adjustable delay. 5,063,312, Cl. 307-603.000.

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Longo, Robert T.; Bardai, Zaher; Manoly, Arthur E.; Forman, Ralph; and Rolph, Randy K., 5,063,323, Cl. 313-309.000.

Barnabie, Edward J.; and Duke, John D., Jr., to Pennsylvania Crusher Corporation. Comminutor with impact, shear and screening sections. 5,062,575, Cl. 241-73.000.

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Bieniarz, Christopher; Welch, J. Christopher; Barnes, Grady; and Schlesinger, Carol A., 5,063,109, Cl. 428-378.000.

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Khan, Farooq A., 5,062,349, Cl. 91-436.000.

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Etlinger, Leon D., 5,062,370, Cl. 108-51.300.

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Gruber, William C.; and Barringer, Eric ., 5,062,891, Cl. 106-20.000.

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Barth, Philip W.: *See*—
Petersen, Kurt E.; Barth, Philip W.; Bryzek, Janusz; and Mallon, Joseph R., Jr., 5,062,302, Cl. 73-754.000.

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Kabelsky, Mikhail, 5,062,361, Cl. 101-269.000.

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Coffindaffer, Timothy W.; Bartolo, Robert G.; and Belfiore, Kathleen A., 5,062,971, Cl. 252-8.600.

Barzilai, Tsipora P.; Chen, Mon-Song; Kadaba, Bharath K.; and Kaplan, Marc A., to International Business Machines Corporation. Flow control for high speed networks. 5,063,562, Cl. 370-94.100.

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Roberts, Simon; Battista, John A.; and Rhodes, Alex, 5,062,323, Cl. 81-15.700.

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Bauer, Peter; Konrad, Rainer; Morgenstern, Herbert; and Schuch, Horst, 5,063,016, Cl. 264-211.210.
Broecker, Franz J.; Arnold, Lothar; and Grafen, Paul, 5,063,194, Cl. 502-314.000.
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 5,062,861, Cl. 8-639.000.
Kroker, Joerg; and Vargiu, Silvio, 5,063,261, Cl. 523-402.000.
Leyendecker, Joachim; Kuenast, Christoph; and Hofmeister, Peter, 5,063,232, Cl. 514-247.000.
Plath, Peter; Eicken, Karl; Goetz, Norbert; Wild, Jochen; Meyer, Norbert; and Wuerzer, Bruno, 5,062,884, Cl. 71-95.000.
Seele, Rainer; Brill, Gunter; Kober, Reiner; Saupe, Thomas; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,062,879, Cl. 71-92.000.

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Turcotte, David E.; and Coker, Daniel E., 5,062,987, Cl. 252-156.000.

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Trace, Adrian L.; and Basten, Mark J., 5,063,287, Cl. 250-214.0AG.

Bateman, Glenn, to Tektronix, Inc. Optical time domain reflectometer having pre and post front panel connector testing capabilities. 5,062,704, Cl. 356-73.100.

Bateman, Jess R. Hydrofoil and surfboard type assembly. 5,062,378, Cl. 114-274.000.

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Butler, Johnny L.; Wakeland, Richard E.; Batson, Donald R.; and Metzger, Robert E., 5,062,439, Cl. 137-15.000.

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—Gonzalez-Oliver, Carlos, 5,063,003, Cl. 264-14.000.

Battista, John A.: *See*—
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Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 5,063,241, Cl. 514-383.000.
Gansen, Peter; Wolfgramm, Rudi; Wolf, Klaus D.; and Lindsey, John J., 5,063,253, Cl. 521-159.000.
Ruckes, Andreas; Brock, Martin; and Weider, Richard, 5,063,252, Cl. 521-108.000.
Schwenner, Eckhard; Stegelmeier, Hartmut; Kazda, Stanislav; and Knorr, Andreas, 5,063,239, Cl. 514-357.000.

Bayles, Frederick L., Jr.; Walsh, Reed H.; and Tipton, Craig D., to Lubrizol Corporation, The. Functional fluid with borated epoxides, carboxylic solubilizers, zinc salts, and calcium complexes. 5,062,975, Cl. 252-33.000.

Bazer, Fuller W., to University of Florida. Use of supplemental dietary riboflavin to increase fertility and/or prolificacy in animals. 5,063,226, Cl. 514-251.000.

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Bazterrica, Enrique J. V.; and Bazterrica, Enrique T. V., 5,063,065, Cl. 424-637.000.

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Schlag, Edward W.; Lindner, Josef; Beavis, Ronald C.; and Grotemeyer, Jurgen, 5,062,935, Cl. 204-157.410.

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Saadi, Robert E.; Becker, Allen R.; Ball, Christopher J.; and Steffan, John, 5,062,453, Cl. 137-624.110.

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Beckner, Edward A. Sheet rolling machine guard apparatus. 5,062,319, Cl. 74-612.000.

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Sjoblom, Bengt I. G., 5,062,286, Cl. 72-305.000.

Bedford, Raymond E.; and LaBarge, William J., to General Motors Corporation. Base metal automotive exhaust catalysts with improved activity and stability and method of making the catalysts. 5,063,193, Cl. 502-304.000.

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Hindley, Richard M., 5,063,240, Cl. 514-369.000.
Sanger, Gareth J.; and Marr, Helen E., 5,063,231, Cl. 514-214.000.

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Begue, Joseph E. Survey nail. 5,062,753, Cl. 411-470.000.

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Sarnosky, Joseph R.; Wolbrink, David W.; Klug, Alan G.; and Behm, Gary E., 5,062,410, Cl. 126-299.00D.

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Jin, JiQuan; Di Shang, Lian; Jin, Guo Quan; Xu, Yong; and Luo, Guo Chun, 5,063,195, Cl. 502-341.000.

Belfiore, Kathleen A.: *See*—
Coffindaffer, Timothy W.; Bartolo, Robert G.; and Belfiore, Kathleen A., 5,062,971, Cl. 252-8.600.

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Drazba, Martin J.; Bellek, Michael L.; Dranoff, Samuel; and Hahn, Paul, 5,062,701, Cl. 351-160.00R.

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Melanotte, Massimo; and Bellezza, Orio, 5,063,424, Cl. 357-23.500.

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McCarten, Paul; and Slagowski, Eugene, 5,062,924, Cl. 162-358.000.

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Bengtsson, Erik A., to Eka Nobel AB. Process in the production of hydrogen peroxide. 5,063,043, Cl. 423-588.000.

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Myler, Ronald J.; and Benjak, Leo, 5,062,255, Cl. 54-7.000.

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Unterborn, Ralph J.; McClain, Michael J.; and Benner, Mark M., 5,062,176, Cl. 15-250.230.

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Marcinkowski, John; Bennett, Herbert W.; and Niwa, Kenji, 5,062,963, Cl. 210-712.000.

Bennitt, Robert A., to Dresser-Rand Company. Frame, crankshaft and crosshead assembly, and a crankshaft and crosshead frame, for a reciprocating-piston machine. 5,062,311, Cl. 74-44.000.

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Beratan, David N.; and Perry, Joseph W., to United States of America, National Aeronautics and Administration. All-optical photochromic spatial light modulators based on photoinduced electron transfer in rigid matrices. 5,062,693, Cl. 359-241.000.

Bergishagen, Finn, to American Maize-Products Company. Blowing and curing of resins and plastics materials with cyclodextrin complexes. 5,063,251, Cl. 521-84.100.

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Berringer, WIlliam A.; and Sulima, Edward J., Jr., to Advanced Prosthestetics Development Corporation. Myoelectrically controlled knee joint locking device. 5,062,857, Cl. 623-25.000.

Berry, Troy R.; and Mills, Larry R. Training device. 5,062,642, Cl. 273-183.00B.

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Brown, J. Michael; McDowell, John F.; and Chang, Kin-Tai, 5,062,962, Cl. 210-698.000.
Conlan, John T.; and Whitekettle, Wilson K., 5,063,248, Cl. 514-665.000.
Donofrio, Deborah K.; and Whitekettle, Wilson K., 5,063,211, Cl. 514-75.000.
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McCullough, T. Miles, 5,062,992, Cl. 252-394.000.
Whitekettle, Wilson K.; and Donofrio, Deborah K., 5,063,213, Cl. 514-75.000.
Whitekettle, Wilson K.; and Donofrio, Deborah K., 5,063,214, Cl. 514-75.000.
Whitekettle, Wilson K.; and Donofrio, Deborah K., 5,063,217, Cl. 514-75.000.
Whitekettle, Wilson K.; and Donofrio, Deborah K., 5,063,218, Cl. 514-75.000.

Beyea, Dana M.; and Meehan, Kathleen, to Polaroid Corporation. Si/Au/Ni alloyed ohmic contact to n-GaAs and fabricating process therefor. 5,063,174, Cl. 437-184.000.

Bhandarkar, Dileep: *See*—
Cutler, David N.; Orbits, David A.; Bhandarkar, Dileep; Cardoza, Wayne; and Witek, Richard T., 5,063,497, Cl. 395-800.000.

Bianchi, William J. Method of playing a jigsaw puzzle board game. 5,062,637, Cl. 273-157.00R.

Bibbey, Carter S.; and Williams, Jack L. Golfing aid. 5,062,643, Cl. 273-188.00A.

Bieniarz, Christopher; Welch, J. Christopher; Barnes, Grady; and Schlesinger, Carol A., to Abbott Laboratories. Covalent attachment of antibodies and antigens to solid phases using extended length heterobifunctional coupling agents. 5,063,109, Cl. 428-378.000.

Bikestream, Inc.: *See*—
Runkel, Kevin D., 5,062,591, Cl. 224-148.000.

Bille, Josef F., to Intelligent Surgical Lasers, Inc. Device for mapping corneal topography. 5,062,702, Cl. 351-212.000.

Billet, Philippe; and Demarchi, Jean-Louis, to Salomon S.A. Shoe or boot having a heating device. 5,062,222, Cl. 36-2.600.

Billings, Calvert. Disinfectant nail polish remover. 5,063,049, Cl. 424-61.000.

Billot, Pierre: *See*—
Bourbon, Pierre; Lagny, Pierre; and Billot, Pierre, 5,063,064, Cl. 424-673.000.

Binder & Co. Aktiengesellschaft: *See*—
Hausmann, Herbert, 5,062,949, Cl. 209-310.000.

Binder, Rolf, to Werner und Kolb Werkzeugmaschinen GmbH. Machining center. 5,062,195, Cl. 29-568.000.

Binder, Stephen F.; and Lanter, Kent J., to Purina Mills, Inc. Concentrated liquid feed supplement containing positionally stabilized eat and method. 5,063,067, Cl. 426-69.000.

Bindomatic AB: *See*—
Bolin, Goran; Latvakangas, Urpo; and Sabelstrom, Jan, 5,062,754, Cl. 412-4.000.

Bingham, Curt G., to Proform Fitness Products, Inc. Reciprocator for a stepper exercise machine. 5,062,627, Cl. 272-70.000.

Biometallics, Inc.: *See*—
Kuehn, Christa G.; Rossi, Debra J.; and Isied, Stephan S., 5,063,151, Cl. 435-7.330.

BioTrol, Inc.: *See*—
Bateson, George F.; Chresand, Thomas J.; Moore, Joel D.; and Nayes, Terrence L., 5,062,958, Cl. 210-611.000.

Birchall, James D.; and Clegg, William J., to Imperial Chemical Industries PLC. Silicon carbide fibre and production thereof. 5,063,107, Cl. 428-367.000.

Bishop, Robert J.; Fontecchio, Robert P.; and Zelenak, Daniel G., Jr., to Allied-Signal Inc. Air bag assembly. 5,062,664, Cl. 280-743.000.

Black & Decker, Inc.: *See*—
Mason, John G.; Miller, John W.; Sauerwein, William D.; and Vick, Stephen L., 5,063,319, Cl. 310-210.000.

Black, Raymond J.; and Han, Benjamin C., to Allied-Signal Inc. Ablative brake bushing for axle thermal protection. 5,062,503, Cl. 188-71.500.

Blackmon, James B.; and Drubka, Robert E., to McDonnell Douglas Corporation. Turbulent droplet generator with boom mounted pitot pump collector. 5,062,472, Cl. 165-41.000.

Blades, Michael W.: *See*—
Liang, Dong C.; and Blades, Michael W., 5,062,708, Cl. 356-316.000.

Blaimschein, Gottfried; and Dietachmayr, Harald, to GMF Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft. Cutting machine for cutting flat workpieces. 5,062,332, Cl. 83-74.000.

Blair, Connie D. Enclosure for curling iron or similar article. 5,062,529, Cl. 206-349.000.

Blaker, James L. Sundial apparatus. 5,062,212, Cl. 33-270.000.

Blanchard, Jean-Luc: *See*—
Duret, Pierre; and Blanchard, Jean-Luc, 5,062,396, Cl. 123-73.0BA.

Blaupunkt Werke GmbH: *See*—
Kitabayashi, Shinichi, 5,063,611, Cl. 455-348.000.

Block Systems Inc.: *See*—
Woolford, Michael E.; and Sievert, Dick J., 5,062,610, Cl. 249-52.000.

Bloks, Hubertus M. H. A., to Fokker Special Products B.V. Protective housing for apparatus. 5,063,273, Cl. 174-35.00R.

Bobba, Ram S., to National Semiconductor Corporation. System and method for testing analog to digital converter embedded in microcontroller. 5,063,383, Cl. 341-120.000.

Bobbowski, Louis G.; and Kon, Richard H., to Stanley Works, The. Continuous hinge with improved bearing design. 5,062,181, Cl. 16-354.000.

Boefringer Mannheim GmbH: *See*—
Stockinger, Hubertus, 5,063,157, Cl. 435-240.200.

Boehringer Mannheim GmbH: *See*—
Ross, Carl H.; Machat, Rudolf; Haring, Werner; and Lettenbauer, Gustav, 5,062,959, Cl. 210-635.000.

Boeing Company, The: *See*—
Novak, Philip F.; Shannon, Robert D.; Pinckney, Robert L.; and Humphreys, James R., Jr., 5,063,384, Cl. 342-1.000.

Boeing of Canada Ltd.: *See*—
Garland, Douglas, 5,062,588, Cl. 244-23.00D.

Boge AG: *See*—
Sommer, Norbert, 5,062,616, Cl. 267-64.170.

Bolanos, Henry: *See*—
Green, David T.; Young, Wayne P.; Bolanos, Henry; Geiste, Robert J.; Ratcliff, Keith; and Alesi, Daniel E., 5,062,563, Cl. 227-176.000.

Boleslawski, Marek P.: *See*—
Eisch, John J.; and Boleslawski, Marek P., 5,063,083, Cl. 427-53.100.

Bolin, Goran; Latvakangas, Urpo; and Sabelstrom, Jan, to Bindomatic AB. Booklet, method and apparatus for producing the same. 5,062,754, Cl. 412-4.000.

Bolsworth, James: *See*—
Griffiths, Guy G. V.; Bolsworth, James; and Appleby, John M., 5,062,182, Cl. 16-368.000.

Bolza-Schunemann, Hans B.: *See*—
Germann, Albrecht J.; Bolza-Schunemann, Hans B.; Schaede, Johannes G.; and Lapp, Joachim A. H., 5,062,360, Cl. 101-152.000.

Bond, Walter D.: *See*—
Arnold, Wesley D., Jr.; Bond, Walter D.; and Lauf, Robert J., 5,062,993, Cl. 257-518.000.

Bonkohara, Manabu: *See*—
Okamoto, Satoru; Terazi, Kazufumi; Nishino, Seiichi; and Bonkohara, Manabu, 5,063,435, Cl. 357-74.000.

Bonnefous, Odile, to U.S. Philips Corporation. Device for measuring the speed of blood flows by ultrasonic echography at an increased measuring speed. 5,062,430, Cl. 128-661.090.

Booth, Bruce L.: *See*—
Furmanak, Robert J.; Booth, Bruce L.; and Foreman, Thomas K., 5,062,681, Cl. 385-50.000.

Borden, Inc.: *See*—
Gillmore, Stephen R.; Merritt, Carleton G.; Chawan, Dhyaneshwar B.; and Matuszak, Edward A., 5,063,072, Cl. 426-557.000.

Bordjugovsky, Andrei A.: *See*—
Bakirov, Murat B.; Getman, Alexandr F.; Gribov, Boris I.; Bordjugovsky, Andrei A.; and Klimenok, Alexandra P., 5,062,293, Cl. 73-81.000.

Borkar, Shekhar, to Intel Corporation. Output driver with static and transient parts. 5,063,308, Cl. 307-443.000.

Borowiec, Joseph C.: *See*—
El-Hamamsy, Sayed-Amr A.; and Borowiec, Joseph C., 5,063,332, Cl. 315-248.000.

Borrelli, Nicholas F.; and Smith, Dennis W., to Corning Incorporated. Method for making an optical device. 5,062,877, Cl. 65-30.130.

Botez, Dan; Mawst, Luke J.; and Peterson, Gary L., to TRW Inc. Semiconductor laser arrays using leaky wave interarray coupling. 5,063,570, Cl. 372-50.000.

Bourbon, Pierre; Lagny, Pierre; and Billot, Pierre, to Atlantic Pharmaceutical Products Ltd. Method for inhibiting or destroying spermatozoa. 5,063,064, Cl. 424-673.000.

Bourdeau, Alain; and de Volder, Claude, to Thomson-CSF. Device for the detection of the signals of transponders interrogated by a secondary radar in the presence of multiple-path phenomena. 5,063,386, Cl. 342-40.000.

Bowman, Charles D., to United States of America, Energy. Nuclear reactivity control using laser induced polarization. 5,063,019, Cl. 376-331.000.

Boyce, Phillip R.: *See*—
Rankin, Russel J.; de Chastel, David J., deceased; Wescombe, Graeme L.; Kerr, David T.; Boyce, Phillip R.; White, Raymond M.; Tritchler, Robert W.; and Buhot, John W., 5,062,820, Cl. 452-187.000.

Boyd, Winnett. Brake actuator for bicycles and the like. 5,062,511, Cl. 192-5.000.

Boyko, Nadina: *See*—
Reiter, Roger; Boyko, Stanley; and Boyko, Nadina, 5,062,572, Cl. 239-899.000.

Boyko, Stanley: *See*—
Reiter, Roger; Boyko, Stanley; and Boyko, Nadina, 5,062,572, Cl. 239-899.000.

BP Chemicals Limited: *See*—
Bailly, Jean-Claude A.; and Collomb, Joelle, 5,063,110, Cl. 428-402.000.

Brack, Chris: *See*—
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, 5,062,288, Cl. 72-383.000.

Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, to Bayer Aktiengesellschaft. Fungicidal agents. 5,063,241, Cl. 514-383.000.

Brandt, Inc.: *See*—
Winkler, Theodore, 5,062,598, Cl. 271-6.000.

Branemark, Per-Ingvar, to Medevelop AB. Anchoring element for supporting a joint mechanism of a finger or other reconstructed joint. 5,062,851, Cl. 623-18.000.

Braun, Paul; and Kwasniewicz, Ronald W., to Kwaun Manufacturing Company. Copying machine. 5,063,406, Cl. 355-57.000.

Braverman, Robert J.; and Shklyarov, Isaak M., to R. J. Braverman Corp. Pen gun. 5,062,230, Cl. 42-1.090.

Braverman, Robert J.; and Shklyarov, Isaak M., to R. J. Braverman Corp. Duel profile pen gun. 5,062,231, Cl. 42-1.090.

Breckenfeld, Paul W.; Nettles, James A.; Rogers, Duane E.; and Broughton, George, to Outboard Marine Corporation. Internal combustion engine. 5,062,403, Cl. 123-413.000.

Breckwoldt, Jorn: *See*—
Hohl, Frank; and Breckwoldt, Jorn, 5,062,889, Cl. 106-197.200.

Bredel, Patrick: *See*—
Terracol, Claude; Bredel, Patrick; and Guillet, Jean-Laurent, 5,062,525, Cl. 198-468.600.

Brel, Jean-Marie: *See*—
Collot, Patrice; Brel, Jean-Marie; and Dehaene, Guy, 5,063,482, Cl. 362-66.000.

Brico Engineering Limited: *See*—
Purnell, Charles G.; and Baker, Andrew R., 5,062,908, Cl. 148-332.000.

Bridge, Peter; and Goodwin, Frederick K., to United States of America, Health and Human Services. Compositions having use as treatment of neuropsychiatric deficits. 5,063,206, Cl. 514-16.000.

Bridgestone Corporation: *See*—
Kaida, Masaaki, 5,062,578, Cl. 242-3.000.

Bridgestone/Firestone, Inc.: *See*—
Tompkins, Dale A.; and Sicka, Richard W., 5,062,782, Cl. 425-113.000.

Briet, Gilles: *See*—
Potier, Michel; and Briet, Gilles, 5,062,478, Cl. 165-178.000.

Brill, Gunter: *See*—
Seele, Rainer; Brill, Gunter; Kober, Reiner; Saupe, Thomas; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,062,879, Cl. 71-92.000.

Bristol-Myers Squibb Company: *See*—
Schelhas, Klaus-Dieter, 5,062,849, Cl. 623-16.000.

British Aerospace plc: *See*—
Aldersley, Alan; and Hayes, Ronald, 5,062,596, Cl. 244-234.000.

British Alcan Aluminium PLC: *See*—
Cobden, Ronald C.; and Shiels, Alan J., 5,062,369, Cl. 105-396.000.

British Gas plc: *See*—
Price, Barry L.; and Thornhill, Christopher J., 5,063,527, Cl. 364-550.000.

British Telecommunications Public Limited Company: *See*—
Ballance, John W., 5,063,595, Cl. 380-48.000.

Broadbent, Eliot K., to North American Philips Corp., Signetics Division. Method for manufacturing a planar electrical interconnection utilizing isotropic deposition of conductive material. 5,063,175, Cl. 437-192.000.

Broan Mfg. Co., Inc.: *See*—
Sarnosky, Joseph R.; Wolbrink, David W.; Klug, Alan G.; and Behm, Gary E., 5,062,410, Cl. 126-299.00D.

Brock, Martin: *See*—
Ruckes, Andreas; Brock, Martin; and Weider, Richard, 5,063,252, Cl. 521-108.000.

Brockwell, John C.; and Collins, Edward J., to International Business Machines Corp. Cost optimization system for supplying parts. 5,063,506, Cl. 364-402.000.

Brodie, Ivor; Gernick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., to Coloray Display Corporation. Field emission cathode based flat panel display having polyimide spacers. 5,063,327, Cl. 313-482.000.

Broeck, Vanden; and De Marchi, Olivier. Connecting device for two members of an artificial joint. 5,062,858, Cl. 623-43.000.

Broecker, Franz J.; Arnold, Lothar; and Grafen, Paul, to BASF Aktiengesellschaft. Palladium catalyst. 5,063,194, Cl. 502-314.000.

Bromley, Scott, to Scott Tech International, Inc. Internal cutting head for drifting pipe. 5,062,187, Cl. 29-33.00T.

Bronan, Denis A.; and Whetsel, James E., to Erico Products, Inc,. Welding process and mixture of reactants for use in such process. 5,062,903, Cl. 148-24.000.

Bronskill, John F.: *See*—
Jaffray, Ian; and Bronskill, John F., 5,063,448, Cl. 358-160.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Nozaki, Yoshihisa; Inden, Takashi; and Takemura, Tohur, 5,062,524, Cl. 198-465.400.
Sakakibara, Kenji, 5,063,405, Cl. 355-32.000.

Broughton, George: *See*—
Breckenfeld, Paul W.; Nettles, James A.; Rogers, Duane E.; and Broughton, George, 5,062,403, Cl. 123-413.000.

Brown, Derek A.; Worth, John N.; and Santaniello, Brian F., to W. R. Grace & Co.-Conn. Method and apparatus for inspecting workpieces. 5,062,711, Cl. 356-394.000.

Brown, Franklin C. Safety device for a firearm. 5,062,233, Cl. 42-70.110.

Brown, Ivonne: *See*—
Verdon, Debra; Tietjen, Marlene; and Brown, Ivonne, 5,063,050, Cl. 424-63.000.

Brown, J. Michael; McDowell, John F.; and Chang, Kin-Tai, to Betz Laboratories, Inc. Methods of controlling scale formation in aqueous systems. 5,062,962, Cl. 210-698.000.

Brown, Linda: *See*—
Suckling, Colin J.; Halling, Peter J.; Johnston, Grant A.; and Brown, Linda, 5,063,149, Cl. 435-4.000.

Brown, Neil, to Vereinigte Aluminum-Werke Aktiengesellschaft. Process for the production of boehmite. 5,063,033, Cl. 423-112.000.

Brown, Omar L.; and Wynn, David K., to Dayton Reliable Tool & Mfg. Co. Method and apparatus for making and transferring shells for cans. 5,062,287, Cl. 72-336.000.

Brown, Robert J.: *See*—
Wiencek, Donald C.; and Brown, Robert J., 5,062,202, Cl. 29-749.000.

Brown & Williamson Tobacco Corporation: *See*—
Aulbach, Paul L.; Frank, Dorothy M.; and Roth, David S., 5,062,434, Cl. 131-336.000.

Brubaker, Bryce D.: *See*—
Myers, Robert I.; Brubaker, Bryce D.; and Overall, Robert E., 5,062,206, Cl. 29-890.010.

Bruderer AG: *See*—
Messner, Helmut, 5,062,561, Cl. 226-152.000.

Brueggemann, Harry P., to Xerox Corporation. Optical scanner with reduced end of scan wobble having an even number of beam reflections. 5,063,292, Cl. 250-236.000.

Bruhn, Rainer, to SWF Auto-Electric GmbH. Electric motor, especially an electric small-power motor for driving wiper systems of motor vehicles. 5,063,317, Cl. 310-91.000.

Bruhnke, Ulrich: *See*—
Arold, Klaus; and Bruhnke, Ulrich, 5,062,353, Cl. 98-2.110.

Bruker-Franzen Analytik GmbH: *See*—
Schlag, Edward W.; Lindner, Josef; Beavis, Ronald C.; and Grotemeyer, Jurgen, 5,062,935, Cl. 204-157.410.

Brumfield, David: *See*—
Jamison, Russell D.; Brumfield, David; and Treharne, Richard, 5,062,844, Cl. 606-54.000.

Brumme, Helma: *See*—
Astheimer, Hans; Brumme, Helma; Heck, Werner; Kissel, Klaus; and Schuy, Hubert, 5,063,464, Cl. 360-104.000.

Brusasco, Enzo, to Roltra, Morse S.p.A. Vehicle door. 5,062,240, Cl. 49-348.000.

Bryant, Henry U.; and Clemens, James A., to Eli Lilly and Company. Method of inhibiting demineralization of bone. 5,063,234, Cl. 514-288.000.

Bryzek, Janusz: *See*—
Petersen, Kurt E.; Barth, Philip W.; Bryzek, Janusz; and Mallon, Joseph R., Jr., 5,062,302, Cl. 73-754.000.

Buchanan, Harry C.; and Victor, Keith R., to General Motors Corporation. Windshield wiper with adjustable wiping pressure. 5,062,175, Cl. 15-103.000.

Budd, Kenton D., to Minnesota Mining and Manufacturing Company. Method of depositing thin films of high temperature Bi-Sr-Ca-Cu-O-based ceramic oxide superconductors. 5,063,199, Cl. 505-1.000.

Buehring, Ian K., to Rank Taylor Hobson Limited. Optical grating with interpolator having multiplying means to produce quadrature signals. 5,063,291, Cl. 250-231.160.

Buhot, John W.: *See*—
Rankin, Russel J.; de Chastel, David J., deceased; Wescombe, Graeme L.; Kerr, David T.; Boyce, Phillip R.; White, Raymond M.; Tritchler, Robert W.; and Buhot, John W., 5,062,820, Cl. 452-187.000.

Bullard, Horace. Vacuum teeth cleaning system. 5,062,413, Cl. 128-66.000.

Bulldog Beratungs-und Vertriebs-GmbH: *See*—
Cholid, Yanbo; Theordorsen, Trygve; and Wilhelmi, Jurgen, 5,062,733, Cl. 403-189.000.

Bullock, Michael A.: *See*—
Conrad, Daniel J.; Davenport, Jerry W.; Isen, Robert R.; Bullock, Michael A.; and Riddell, Wilfred E., 5,062,716, Cl. 383-9.000.

Burchette, Herbert L.: *See*—
Worley, Kevin L.; Mayers, John L.; and Burchette, Herbert L., 5,062,767, Cl. 415-209.300.

Burda, Dan S. Rotary shear-type shredder cutter with rectangular feed tooth. 5,062,576, Cl. 241-167.000.

Burges, Denis H.; and Jarrett, Paul, to Agricultural Genetics Company, Limited. Preparation of strains of *Bacillus thuringiensis* having an improved activity against certain lepidopterous pests and novel strain produced thereby. 5,063,055, Cl. 424-93.000.

Burgfels, Gotz; Kochloefl, Karl; Ladebeck, Jurgen; Schmidt, Friedrich; Schneider, Michael; and Wernicke, Hans J., to Sud-Chemie Aktiengesellschaft. Catalyst based on crystalline aluminosilicate. 5,063,187, Cl. 502-71.000.

Burk, Michael: *See*—
Dalebout, William T.; and Burk, Michael, 5,062,632, Cl. 272-129.000.

Burke, Mervin G. Sulky. 5,062,652, Cl. 280-64.000.

Burkinshaw, Brian D.: *See*—
Dorr, Lawrence D.; Burkinshaw, Brian D.; and Skraba, Joseph S., 5,062,852, Cl. 623-20.000.

Burlington Industries, Inc.: *See*—
Neustat, Paula; and Marchiony, Larry, 5,062,534, Cl. 211-48.000.

Burndy Corporation: *See*—
Hoover, John B., 5,062,290, Cl. 72-416.000.

Burns, James A.; and Reischel, Joseph G., to Minnesota Mining and Manufacturing Company. Respiratory mask having a soft, compliant facepiece and a thin, rigid insert and method of making. 5,062,421, Cl. 128-205.270.

Burns, Marsha L., to MarShel Corporation. Refrigerator or freezer freshening device and process. 5,062,272, Cl. 62-78.000.

Burshteyn, Alexander: *See*—
Siiman, Olavi; and Burshteyn, Alexander, 5,062,991, Cl. 252-315.200.

Burt, Peter J., to David Sarnoff Research Center, Inc. Dynamic method for recognizing objects and image processing system therefor. 5,063,603, Cl. 382-37.000.

Burtch, John E.: *See*—
Hill, James A.; and Burtch, John E., 5,062,568, Cl. 229-1.50B.

Busato, Giampaolo: *See*—
Tedesco, Raffaele; Busato, Giampaolo; and Sinatora, Giampaolo, 5,063,099, Cl. 428-109.000.

Busch, Alfred: *See*—
Baeck, Andre C.; Busch, Alfred; and Oh, Young S., 5,062,972, Cl. 252-8.800.

Buschow, Kurt H. J.; de Mooij, Dirk B.; and Jacobs, Theodora H., to U.S. Philips Corp. Hard magnetic material and magnet manufactured from such hard magnetic material. 5,062,907, Cl. 148-301.000.

Butler, Johnny L.; Wakeland, Richard E.; Batson, Donald R.; and Metzger, Robert E., to Spinsafe, Inc. Method and apparatus to facilitate the injection of sealant into a pressurized fluid member. 5,062,439, Cl. 137-15.000.

Butler, Kenneth: *See*—
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, 5,062,288, Cl. 72-383.000.

Buzy-Vigneau, Jean-Paul, to Lorraine Distribution Buzy-Vigneau. Automatic dispenser for bakery products and the like. 5,062,544, Cl. 221-130.000.

Buzzella, David, to Metal Tech, Inc. Insulating panel system, panels and connectors therefor. 5,062,250, Cl. 52-584.000.

Byalik, Ludmila: *See*—
Robertson, Diane M.; and Byalik, Ludmila, 5,063,104, Cl. 428-286.000.

C. & E. Fein GmbH & Co.: *See*—
Wieland, Dietrich; Kalb, Martin; Grupp, Werner; and Nothofer, Michael, 5,062,743, Cl. 408-6.000.

C. E. Johansson AB: *See*—
Gustafsson, Carl-Erik; and Pettersson, Bo, 5,062,214, Cl. 33-706.000.

Cabot Corporation: *See*—
Menashi, Jameel; and Koehlert, Kenneth C., 5,063,179, Cl. 501-12.000.

Cady, Byron C.: *See*—
Story, Carl E.; Nichols, Jerry A.; and Cady, Byron C., 5,062,770, Cl. 417-46.000.

Cain, Michael B.; Desorcie, Robert B.; Kannabiran, Rengan; Kar, Gitimoy; and Urruti, Eric H., to Corning Incorporated. Coated optical fibers and cables and method. 5,062,685, Cl. 350-96.230.

Cakmakci, Mehmet Y., to Aeroquip Corporation. Method for molding trim strips by extrusion molding in an open mold. 5,063,014, Cl. 264-151.000.

Cale, Albert D., Jr.; and Gero, Thomas W., to A. H. Robbins Company, Incorporated. 4-(substitutedaminoethyl)-3,4-dihydro-2-alkylpyrimido[1,6-a]benzimidazol-1(2H)-ones as antiarrhythmic agents. 5,063,228, Cl. 574-253.000.

Calgon Carbon Corporation: *See*—
Doughty, David T.; and Groose, James E., 5,063,196, Cl. 502-417.000.

Calgon Corporation: *See*—
Muia, Ramon A.; and Donlan, Rodney M., 5,062,967, Cl. 210-755.000.

California Institute of Technology: *See*—
—Hopfield, John J., 5,063,417, Cl. 357-8.000.

Callaway, Edgar H., Jr.: *See*—
Williams, William R.; and Callaway, Edgar H., Jr., 5,063,357, Cl. 331-49.000.

Camberfield Manufacturing Limited: *See*—
Campbell, Raymond D., 5,062,617, Cl. 267-132.000.

Cameron, Robert W. Vehicle seatbelt having an integral airbag. 5,062,662, Cl. 280-733.000.

Campbell, Henry F.: *See*—
Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., 5,063,230, Cl. 514-213.000.

Campbell, John E.: *See*—
Bailey, Thomas F.; and Campbell, John E., 5,062,450, Cl. 137-533.210.

Campbell, Raymond D., to Camberfield Manufacturing Limited. Shock absorbing support post. 5,062,617, Cl. 267-132.000.

Campos, William. Saw guide apparatus. 5,062,339, Cl. 83-763.000.

Camshaft Machine Company: *See*—
Lewan, Philip C., 5,062,953, Cl. 210-232.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Legare, Pierre; and Pike, David W., 5,062,874, Cl. 55-337.000.

Candland, Calvin T.; Christianson, Kim L.; Kennedy, James L.; Smith, David A.; Nosan, Francis J.; and Overend, Steven F., to Honeywell Inc. Temperature compensating control system for adjusting primary propellant chamber volume. 5,062,366, Cl. 102-430.000.

Canfield, Barth A.; and Fling, Russell T., to Thomson Consumer Electronics, Inc. Apparatus for conditioning a control signal. 5,063,580, Cl. 377-55.000.

Canistraro, Howard: *See*—
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Carrier Corporation: *See*—
DeSantis, John J., 5,063,314, Cl. 310-71.000.
Heitmann, Erric L.; and Shaw, David N., 5,062,277, Cl. 62-193.000.
Shaw, David N., 5,062,274, Cl. 62-117.000.

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Carter, Robert E., to Teldix GmbH. Torsional vibration drive. 5,063,321, Cl. 310-323.000.

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Drouet, Ludovic O.; Bal Dit Sollier, Claire; Mazoyer, Elisobeth M.; Levy Toledano, Sylviane; Jolles, Pierre; and Fiat, Ann-Taiic D., 5,063,203, Cl. 514-8.000.

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Gruber, William C.; and Barringer, Eric ., 5,062,891, Cl. 106-20.000.

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Schwartz, Russell J.; Zwirgzdas, Anthony C.; and Chamberlain, Terence R., 5,062,894, Cl. 106-23.000.

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Hannigan, Judson, 5,062,216, Cl. 34-16.000.

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McRae, Howard F., 5,063,266, Cl. 524-269.000.

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Chance, Britton, to Nim Incorporated. Method and device for in vivo diagnosis detecting IR emission by body organ. 5,062,428, Cl. 128-664.000.

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Chang, Joseph. Microbial products used for treatment of hepatitis. 5,063,054, Cl. 424-92.000.

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Chang, Ming-Ju; Hsu, Yuan-Hsun; Kuo, Mei-Hui; and Soong, Tai-Sen, to Development Center for Biotechnology. Process for the isolation of antifungal agents (5-methoxy-7-hydroxyflavan from dragon's blood resin and its use in agriculture. 5,063,244, Cl. 514-456.000.

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Jansen, Frank; and Chen, Inan, 5,063,397, Cl. 346-153.100.

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Chen, Sy-Hwa; and Sung, Chien-Min, to Norton Company. Chemically bonded superabrasive grit. 5,062,865, Cl. 51-295.000.

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Ferre, Alain; Chevance, Christophe; and Quignon, Jean, 5,063,524, Cl. 364-516.000.

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Sciamanna, Steven F., 5,062,955, Cl. 210-512.100.

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Duncan, Frank L.; and Chiaramonte, Vincent, 5,062,799, Cl. 433-215.000.

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Chiba, Moichi, to Nippon Seiko Kabushiki Kaisha. Rolling bearing with sleeve. 5,062,721, Cl. 384-536.000.

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Matsumoto, Shunichiro; Inui, Tsutomu; Ichiyasu, Rokuo; and Chiba, Yoshitaka, 5,062,885, Cl. 75-255.000.

Chiba, Yoshiteru: *See*—
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, 5,063,200, Cl. 505-1.000.

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Jin, JiQuan; Di Shang, Lian; Jin, Guo Quan; Xu, Yong; and Luo, Guo Chun, 5,063,195, Cl. 502-341.000.

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Nakajima, Hirokazu, 5,063,264, Cl. 524-118.000.

Chitty, Clive L.; and Whatmore, Roger W., to GEC Plessey Telecommunications Limited. Coin validation apparatus. 5,062,518, Cl. 194-317.000.

Chiu, Hsiu-Hui, to Sunshon Molding Co., Ltd. Wheel unit for a slidable infant chair. 5,062,178, Cl. 16-38.000.

Chivas Products Limited: *See*—
Phelps, Richard A.; and Lorence, Brian S., 5,062,608, Cl. 248-289.100.

Cho, Hidetsura; Ueda, Masaru; Tamaoka, Mie; Hamaguchi, Mikiko; Murota, Seiitsu; and Morita, Ikuo, to Suntory, Ltd. Derivative of caffeic acid and pharmaceutical composition containing the same. 5,063,243, Cl. 514-438.000.

Cho, Suk-rae, to Samsung Electron Devices Co., Ltd. Dynamic focus electron gun. 5,063,326, Cl. 313-414.000.

Choi, Jae H., to AT&T Laboratories. Flexible articles formed from polyurethanes by RIM processes. 5,063,017, Cl. 264-328.600.

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Turkevich, Leonid A.; and Choi, Kee-Ju, 5,063,301, Cl. 250-574.000.

Cholid, Yanbo; Theordorsen, Trygve; and Wilhelmi, Jurgen, to Bulldog Beratungs-und Vertriebs-GmbH. Joining element for beams. 5,062,733, Cl. 403-189.000.

Chollet, Patrick: *See*—
Leprince, Philippe; Chollet, Patrick; and Saada, Serge, 5,063,330, Cl. 315-111.210.

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Bateson, George F.; Chresand, Thomas J.; Moore, Joel D.; and Nayes, Terrence L., 5,062,958, Cl. 210-611.000.

Christensen, Robert W., to Epitaxy Systems, Inc. Induction heated pancake epitaxial reactor. 5,062,386, Cl. 118-725.000.

Christianson, Kim L.: *See*—
Candland, Calvin T.; Christianson, Kim L.; Kennedy, James L.; Smith, David A.; Nosan, Francis J.; and Overend, Steven F., 5,062,366, Cl. 102-430.000.

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Kirker, Garry W.; Klocke, Donald J.; Vartuli, James C.; Chu, Pochen; Marler, David O.; and McWilliams, John P., 5,063,038, Cl. 423-328.000.

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Nishii, Yasuho; and Takita, Yumiko, 5,063,221, Cl. 514-167.000.

Chuman, Tatsuji; and Ono, Mikio, to Japan Tobacco Inc. Method of attracting *Tribolium confusum J.* using 2,6-dimethyl-1-octanol. 5,063,058, Cl. 424-405.000.

Chyou, Yang-Chih: *See*—
Liu, Yun-Yu; Shih, Hsiao-Lei; Chyou, Yang-Chih; and Laiw, Ming-Shing, 5,062,805, Cl. 439-404.000.

Ciba-Geigy Corporation: *See*—
Babler, Fridolin, 5,063,258, Cl. 523-171.000.
Chen, Jen; and Hutchison, Alan J., 5,063,233, Cl. 514-266.000.
Gsell, Laurenz, 5,063,236, Cl. 514-318.000.

Cimarosti, Luigi R. Clutch control device. 5,062,515, Cl. 192-91.00A.

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Bernstein, Joel E., 5,063,060, Cl. 424-422.000.

City of Hope: *See*—
Morton, Jay, 5,062,542, Cl. 220-269.000.

Clappier, Robert R.: *See*—
Van Buskirk, Robert S.; and Clappier, Robert R., 5,062,304, Cl. 73-861.000.

Clark, Earl M.: *See*—
Lee, Kung H.; and Clark, Earl M., 5,062,273, Cl. 62-85.000.

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Clayton, Jane B.; and Miller, Calvin M., to AT&T Bell Laboratories. Optical fiber filter. 5,062,684, Cl. 385-27.000.

Clean Air Technologies Inc.: *See*—
Kunst, Neil W.; Fraser, James D.; and Amaro, Josephina, 5,063,515, Cl. 364-431.010.

Cleary, James D.; and Eckert, Robert P., to Minnesota Mining and Manufacturing Company. Debonding instrument for orthodontic brackets. 5,062,793, Cl. 433-3.000.

Clegg, William J.: *See*—
Birchall, James D.; and Clegg, William J., 5,063,107, Cl. 428-367.000.

Clemence, Francois; Frechet, Daniel; Hamon, Gilles; and Jouquey, Simone, to Roussel Uclaf. Benzothiazepines. 5,063,225, Cl. 514-211.000.

Clemens, James A.: *See*—
Bryant, Henry U.; and Clemens, James A., 5,063,234, Cl. 514-288.000.

Clinton Industries, Inc.: *See*—
Wokeck, Arthur C.; and Opuszenski, Theodore, 5,062,374, Cl. 112-130.000.

Clyde Corporation: *See*—
Hockman, Edward N., 5,062,521, Cl. 198-389.000.

Cobden, Ronald C.; and Shiels, Alan J., to British Alcan Aluminium PLC. Frame structure. 5,062,369, Cl. 105-396.000.

Coca-Cola Company, The: *See*—
Whigham, Roger C.; and Hoover, George H., 5,062,555, Cl. 222-641.000.

Coffindaffer, Timothy W.; Bartolo, Robert G.; and Belfiore, Kathleen A., to Procter & Gamble Company, The. Starch with silicone gel for ease of ironing and improved fabric appearance after ironing. 5,062,971, Cl. 252-8.600.

Coherent, Inc.: *See*—
Tiffany, William B., 5,062,842, Cl. 606-3.000.

Coker, Daniel E.: *See*—
Turcotte, David E.; and Coker, Daniel E., 5,062,987, Cl. 252-156.000.

Cold Jet, Inc.: *See*—
Lloyd, Daniel L.; and Cooke, Eugene L., 5,063,015, Cl. 264-161.000.

Cole, David M.: *See*—
Gould, Larry D.; and Cole, David M., 5,062,303, Cl. 73-798.000.

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Coleman, Lewis: *See*—
Rosenfeld, Elieser Z.; and Coleman, Lewis, 5,063,275, Cl. 250-343.000.

Coles, Mary E.; and Muegge, Ernest L., to Mobil Oil Corporation. Method for determining density of samples of materials employing X-ray energy attenuation measurements. 5,063,509, Cl. 364-420.000.

Colineau, Joseph; and Machui, Jurgen, to Thomson-CSF. Magnetic head with saturable gap and matrix device comprising a multiplicity of such heads. 5,063,467, Cl. 360-119.000.

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Brockwell, John C.; and Collins, Edward J., 5,063,506, Cl. 364-402.000.

Collins, Michael C.; and Collins, Walter W. Multifunction tool. 5,062,173, Cl. 7-118.000.

Collins, Walter W.: *See*—
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Collomb, Joelle: *See*—
Bailly, Jean-Claude A.; and Collomb, Joelle, 5,063,110, Cl. 428-402.000.

Collot, Patrice; Brel, Jean-Marie; and Dehaene, Guy, to Valeo Vision. Motor vehicle headlight including an indicator device for indicating the elevation direction of its reflector. 5,063,482, Cl. 362-66.000.

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Brodie, Ivor; Gernick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., 5,063,327, Cl. 313-482.000.

Colvin, Barry D.: *See*—
Bescherer, Robert E.; and Colvin, Barry D., 5,062,390, Cl. 119-72.000.

Com Dev Ltd.: *See*—
Tsoi, Paul Y., 5,063,364, Cl. 333-107.000.

Comer, Lloyd: *See*—
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, 5,062,288, Cl. 72-383.000.

Commissariat a l'Energie Atomique: *See*—
Doury-Berthod, Michele; and Giampaoli, Pierre, 5,062,961, Cl. 210-656.000.

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Commonwealth Scientific & Industrial Research Organisation: *See*—
Rankin, Russel J.; de Chastel, David J., deceased; Wescombe, Graeme L.; Kerr, David T.; Boyce, Phillip R.; White, Raymond M.; Tritchler, Robert W.; and Buhot, John W., 5,062,820, Cl. 452-187.000.

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Deroux-Dauphin, Patrice, 5,062,196, Cl. 29-603.000.

COMSAT: *See*—
Geller, Bernard D.; Tyler, Johann U.; Holdeman, Louis B.; Phelleps, Fred R.; and Laird, George F., III, 5,063,177, Cl. 437-209.000.

Concannon, David; Copenhaver, Gary; Bakker, Johan; Vala, John; Banks, Gerald; and Catchpole, Clive, to Unisys Corporation. Electronic image lift. 5,063,599, Cl. 382-7.000.

Conlan, John T.; and Whitekettle, Wilson K., to Betz Laboratories, Inc. Biocidal compositions and use thereof containing a synergistic mixture of glutaraldehyde and 2-(decylthio) ethanamine. 5,063,248, Cl. 514-665.000.

Connectix, Inc.: *See*—
Garber, Jonathan F., 5,063,499, Cl. 395-500.000.

Connell, Victoria: *See*—
Spellman, Joseph X.; Beck, Marlene C.; and Connell, Victoria, 5,063,057, Cl. 424-401.000.

Connolly, Kevin J.; D'Aleo, James M.; and Griffith, Clifford J., to Garden Way Incorporated. Leaf tamper for chipper/shredder. 5,062,329, Cl. 81-488.000.

Conoco Inc.: *See*—
Jones, Richard L., 5,063,271, Cl. 524-351.000.

Conrad, Daniel J.; Davenport, Jerry W.; Isen, Robert R.; Bullock, Michael A.; and Riddell, Wilfred E., to Kimberly-Clark Corp.; and Paramount Packaging Corp. Staged release bag and method for making. 5,062,716, Cl. 383-9.000.

Cook, David C.: *See*—
Hynds, Ernest J.; Stowe, Keith A.; and Cook, David C., 5,062,656, Cl. 280-689.000.

Cook, Harold T., Jr.; and Fielding, Mimi S., to Marco Seattle, Inc. Artificial bait for fish and shellfish. 5,062,235, Cl. 43-42.000.

Cooke, Eugene L.: *See*—
Lloyd, Daniel L.; and Cooke, Eugene L., 5,063,015, Cl. 264-161.000.

Cooke, Horise M.; and Deiss, Richard F., to Parker-Hannifin Corporation. Kink-resistant, small bend radius hose with polyfluorocarbon liner. 5,062,456, Cl. 138-125.000.

Cooper, Douglas W.: *See*—
McDermott, Wayne T.; Ockovic, Richard C.; Wu, Jin J.; Cooper, Douglas W.; Schwarz, Alexander; and Wolfe, Henry L., 5,062,898, Cl. 134-7.000.

Cooper Industries: *See*—
Urban, Paul L., 5,062,564, Cl. 228-9.000.

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Deremo, Edwin J., 5,062,746, Cl. 408-79.000.
Schlitt, George J., 5,062,215, Cl. 33-755.000.

Cooper, Kelvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, to Pfizer Inc. 1,4-dihydro-2-(4-[benzimidazol-1-yl]phenyl)-pyridines as platelet activating factor antagonists. 5,063,237, Cl. 514-338.000.

Cooper, Larry: *See*—
Whitesel, J. Warren; and Cooper, Larry, 5,062,408, Cl. 126-41.00R.

Cooper Power Systems, Inc.: *See*—
Arnold, Wesley D., Jr.; Bond, Walter D.; and Lauf, Robert J., 5,062,993, Cl. 257-518.000.

Copenhaver, Gary; Bakker, Johan; and Vala, John, to Unisys Corporation (Formerly Burroughs Corp.). Packaging of components for image lift. 5,063,461, Cl. 358-474.000.

Copenhaver, Gary: *See*—
Concannon, David; Copenhaver, Gary; Bakker, Johan; Vala, John; Banks, Gerald; and Catchpole, Clive, 5,063,599, Cl. 382-7.000.

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Coppier, Herve ; Pourailly, Jean-Louis; and Roger, Joseph, to Thomson-CSF. Electromagnetic energy radiation pick-up. 5,063,363, Cl. 333-33.000.

Corcoran, John. High density storage facility. 5,062,242, Cl. 52-36.000.

Cordis Corporation: *See*—
Fontirroche, Carlos A.; and Truckai, Csaba, 5,063,018, Cl. 264-514.000.

Core-Vent Corporation: *See*—
Niznick, Gerald A., 5,062,800, Cl. 433-229.000.

Corin, James D.: *See*—
Kuslich, Stephen D.; and Corin, James D., 5,062,845, Cl. 606-80.000.

Corning Incorporated: *See*—
Borrelli, Nicholas F.; and Smith, Dennis W., 5,062,877, Cl. 65-30.130.
Cain, Michael B.; Desorcie, Robert B.; Kannabiran, Rengan; Kar, Gitimoy; and Urruti, Eric H., 5,062,685, Cl. 350-96.230.
Hampton, Leslie E.; and Thompson, David F., 5,062,911, Cl. 156-89.000.

Coulter Corporation: *See*—
Siiman, Olavi; and Burshteyn, Alexander, 5,062,991, Cl. 252-315.200.

Cowen, Timothy B., to Mentor Corporation. Prosthesis with improved pump. 5,062,417, Cl. 128-79.000.

Cox, Karen L.; Seno, Eugene T.; and Wild, Gene M., to Eli Lilly and Company. Method for producing 2'''-O-demethyltylosin. 5,063,155, Cl. 435-76.000.

Coy, Gerald L.: *See*—
Kress, Glenn F.; and Coy, Gerald L., 5,062,602, Cl. 271-104.000.

Coy, Walter G. Medicine caddy or tray. 5,062,531, Cl. 206-564.000.

Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; and Wieck, Henry J., to I-Stat Corporation. Method of manufacturing a plurality of uniform microfabricated sensing devices having an immobilized ligand receptor. 5,063,081, Cl. 427-2.000.

Crabb, Charles C.: *See*—
Wanat, Robert A.; and Crabb, Charles C., 5,063,259, Cl. 523-201.000.

Crafts, Harold S., to NCR Corporation. High density input/output cell arrangement for integrated circuits. 5,063,429, Cl. 357-40.000.

Crandall, John H.; Davis, Stephen J.; and Reynolds, Brett S., to AT&T Bell Laboratories. Yellow alarm control in DS1 SF and DS1 ESF transcoding. 5,063,564, Cl. 370-110.100.

Creative Products Resource Associates, Ltd.: *See*—
Kellett, George W., 5,062,973, Cl. 252-8.750.

Crist, Michael A. Volleyball training apparatus. 5,062,646, Cl. 273-411.000.

Crossley, P. Anthony: *See*—
Nishihara, H. Keith; Crossley, P. Anthony; Hunt, Neil D.; and Tenenbaum, J. Martin, 5,062,567, Cl. 228-105.000.

Crowley, Steven R.: *See*—
Rosenberg, Saul H.; Spina, Kenneth P.; and Crowley, Steven R., 5,063,208, Cl. 514-19.000.

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Krehl, Michael E., 5,062,389, Cl. 119-57.600.

Cully, Jan: *See*—
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Cummings Incorporated, The International Sign Service: *See*—
Cummings, Thomas L., III; and Al-Orfali, Ned S., 5,063,486, Cl. 362-217.000.
Ferre, Alain; Chevance, Christophe; and Quignon, Jean, 5,063,524, Cl. 364-516.000.

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Curreri, Victor; Klein, John; and Dubois, Janine, to Grumman Aerospace Corporation. Alarm system for a crystal growing furnace. 5,063,518, Cl. 364-503.000.

Curry, Joseph R. Counting device. 5,063,285, Cl. 235-114.000.

Curtis Manufacturing Company, Inc.: *See*—
Hames, Edward L.; and Howitt, Robert, 5,062,609, Cl. 248-676.000.

Custers, Pieter H.; and Stulens, Ludo M. J., to U.S. Philips Corporation. Apparatus for automatically reproducing a user-defined preferred selection from a record carrier. 5,063,547, Cl. 369-32.000.

Cutler, David N.; Orbits, David A.; Bhandarkar, Dileep; Cardoza, Wayne; and Witek, Richard T., to Digital Equipment Corporation. Apparatus and method for recovering from missing page faults in vector data processing operations. 5,063,497, Cl. 395-800.000.

Da Costa, Caio M. F. N., to Expressa Brasileira de Compressores S.A.-Embraco. Outlet valve for a rolling piston rotary compressor. 5,062,779, Cl. 418-270.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Fujita, Takeshi; Isoda, Chuzo; and Aketa, Kazuyo, 5,062,986, Cl. 252-134.000.

Daiichi Denso Buhin Co., Ltd.: *See*—
Takano, T.; Kosuga, Y.; and Sinzawa, K., 5,063,277, Cl. 200-531.000.

Daimler-Benz AG: *See*—
Jurgens, Gunter; Surig, Udo; and Lang, Lothar, 5,063,510, Cl. 364-424.100.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See*—
Hoshino, Akira; Saji, Mikio; and Yamaguchi, Isamu, 5,063,256, Cl. 523-102.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Kiyonari, Toshiyuki; Hirabayashi, Satoshi; Kidokoro, Naoto; and Takimoto, Futoshi, 5,063,137, Cl. 430-292.000.

Dalebout, William T.; and Jensen, Jon, to Proform Fitness Products, Inc. Treadmill speed adjustment. 5,062,626, Cl. 272-69.000.

Dalebout, William T.; and Burk, Michael, to Proform Fitness Products, Inc. User programmable exercise machine. 5,062,632, Cl. 272-129.000.

D'Aleo, James M.: *See*—
Connolly, Kevin J.; D'Aleo, James M.; and Griffith, Clifford J., 5,062,329, Cl. 81-488.000.

Daly, Paul D., to Siemens Automotive L.P. Intake manifold/fuel rail and method. 5,062,405, Cl. 123-468.000.

Danfoss A/S: *See*—
Hansen, Henry; Studsgaard, Leif; and Laursen, Erik, 5,062,305, Cl. 73-861.120.
Stenstrom, Theiss; Molbaek, Jens J.; Hyldig, Poul E.; and Straede, Bjarne, 5,062,442, Cl. 137-110.000.

Danglot, Bernard. Electrical or electronic control key pad. 5,063,478, Cl. 361-405.000.

Daniel, Mark L.: *See*—
Hardenbrook, James M.; Williams, Richard E.; and Daniel, Mark L., 5,063,297, Cl. 250-458.100.

Dansk Industri Syndikat A/S: *See*—
Greve Hansen, Niels F.; and Greve Hansen, Jorn H., 5,062,346, Cl. 89-14.100.
Mortensen, Anders, 5,062,465, Cl. 164-4.100.

DaSalvo, Stanley A. Portable ramp. 5,062,174, Cl. 14-69.500.

Datacube Inc.: *See*—
Siegel, Shepard L., 5,063,608, Cl. 382-56.000.

Datta, Rathin: *See*—
Glassner, David A.; Jain, Mahendra K.; and Datta, Rathin, 5,063,156, Cl. 435-150.000.

Dau, William S.; and Jaen-Guardia, Ernest, Jr. Barbell clamp. 5,062,631, Cl. 272-123.000.

d'Autume, Georges, to Jupiter Telescope Co., Inc. Pivotless equatorial table for a telescope. 5,062,699, Cl. 359-430.000.

Davenport, Jerry W.: *See*—
Conrad, Daniel J.; Davenport, Jerry W.; Isen, Robert R.; Bullock, Michael A.; and Riddell, Wilfred E., 5,062,716, Cl. 383-9.000.

Daverio AG: *See*—
Maier, Willy, 5,062,763, Cl. 414-787.000.

David R. Webb Co., Inc.: *See*—
Weil, George, 5,062,218, Cl. 34-114.000.

David Sarnoff Research Center, Inc.: *See*—
Burt, Peter J., 5,063,603, Cl. 382-37.000.
Roach, William R., 5,063,378, Cl. 340-784.000.

Davidowski, Dennis J.; Saunders, Michael J.; and O'Brien, Steven M., to Unisys Corporation. Programmable data communications system. 5,063,494, Cl. 395-800.000.

Davies, Bruce, to Water Regeneration Systems, Inc. Electrolytic liquid purification apparatus. 5,062,940, Cl. 204-228.000.

Davis, Clarke D.: *See*—
Anand, Vidhu; Sampath, Sanjay; Davis, Clarke D.; and Houck, David L., 5,063,021, Cl. 419-12.000.

Davis, Graham: *See*—
Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; and Wieck, Henry J., 5,063,081, Cl. 427-2.000.

Davis, Ray E.; Duncan, Dana L.; Habboosh, Samir W.; Hall, James R.; Nudelman, Dennis L.; and Westkamper, Michael J., to Lever Brothers Company, Division of Conopco, Inc. Apparatus and method for detecting inhomogeneities in semi-plastic substances through ultrasound. 5,062,299, Cl. 73-609.000.

Davis, Stephen J.: *See*—
Crandall, John H.; Davis, Stephen J.; and Reynolds, Brett S., 5,063,564, Cl. 370-110.100.

Davison, Ellard D., Jr.; and Rabhi, Lounes, to General Motors Corporation. Transmission breather control valve and vent. 5,062,447, Cl. 137-493.000.

Dayan, Richard A.; Geisler, Douglas R.; Kinnear, Scott G.; Macon, James F., Jr.; and Schwartz, William H., to International Business Machines Corporation. Signaling attempted transfer to protected entry point bios routine. 5,063,496, Cl. 395-700.000.

Dayton Reliable Tool & Mfg. Co.: *See*—
Brown, Omar L.; and Wynn, David K., 5,062,287, Cl. 72-336.000.

De la Rue Giorgi S.A.: *See*—
Giori, Gualtiero, 5,062,359, Cl. 101-152.000.

De la Rue Giori S.A.: *See*—
Germann, Albrecht J.; Bolza-Schunemann, Hans B.; Schaede, Johannes G.; and Lapp, Joachim A. H., 5,062,360, Cl. 101-152.000.

Dean, Bryan L.: *See*—
Reiling, Victor G.; and Dean, Bryan L., 5,062,341, Cl. 84-702.000.

de Boer, Jan: *See*—
Roovers, Wilhemus M. M.; and de Boer, Jan, 5,062,984, Cl. 525-67.000.

De brabandere, Luc A.: *See*—
De Keyzer, Rene M.; Odeurs, Raymond L.; and De brabandere, Luc A., 5,063,136, Cl. 430-248.000.

De Bruin, Leendert; Verhaar, Robertus D. J.; and Van Laarhoven, Josephus M. F. G., to U.S. Philips Corporation. Selectively plating conductive pillars in manufacturing a semiconductor device. 5,063,169, Cl. 437-41.000.

de Chastel, Ann, executrix: *See*—
Rankin, Russel J.; de Chastel, David J., deceased; Wescombe, Graeme L.; Kerr, David T.; Boyce, Phillip R.; White, Raymond M.; Tritchler, Robert W.; and Buhot, John W., 5,062,820, Cl. 452-187.000.

de Chastel, David J., deceased: *See*—
Rankin, Russel J.; de Chastel, David J., deceased; Wescombe, Graeme L.; Kerr, David T.; Boyce, Phillip R.; White, Raymond M.; Tritchler, Robert W.; and Buhot, John W., 5,062,820, Cl. 452-187.000.

DeFilippi, Louis J.: *See*—
Lupton, F. Stephen; DeFilippi, Louis J.; and Goodman, James R., 5,062,956, Cl. 210-611.000.

de Gelis, Pierre: *See*—
Berneron, Roger; and de Gelis, Pierre, 5,062,900, Cl. 148-4.000.

Degen, Helmut: *See*—
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 5,062,861, Cl. 8-639.000.

De Gier, Gertrudis M. G.; and Sytstra, Jan R., to Verachtert Beheer B.V. Device for breaking objects consisting of concrete or similar material. 5,062,227, Cl. 37-117.500.

Deglis, Janis W.; and Amrich, Robert C. Multipurpose recreational cart. 5,062,653, Cl. 280-648.000.

de Grunt, F.: *See*—
Nieuwenhuize, O. V.; de Grunt, F.; de Vissser, S.; and Vos, R., 5,063,106, Cl. 428-343.000.

Degussa Corporation: *See*—
—Hulse, Sid D.; Maurice, D. V.; Ward, Nelson E.; and Wicker, David L., 5,063,066, Cl. 426-2.000.

Dehaene, Guy: *See*—
Collot, Patrice; Brel, Jean-Marie; and Dehaene, Guy, 5,063,482, Cl. 362-66.000.

Deig, Don: *See*—
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, 5,062,288, Cl. 72-383.000.

Deisinger, John J., to A. O. Smith Corp. Simultaneous signal devices testing in response to periodic function of an operating device in a system. 5,063,374, Cl. 340-642.000.

Deiss, Richard F.: *See*—
Cooke, Horise M.; and Deiss, Richard F., 5,062,456, Cl. 138-125.000.

De Keyzer, Rene M.; Odeurs, Raymond L.; and De brabandere, Luc A., to AGFA-Gevaert, N.V. Processing liquid for use in DTR-photography with two toners. 5,063,136, Cl. 430-248.000.

DeLand, Daniel L., to Masco Industries, Inc. Varying radius helical cable spool for powered vehicle door systems. 5,062,241, Cl. 49-460.000.

Delco Electronics Corp.: *See*—
Headley, Philip M.; and Kulkarni, Prakash K., 5,063,514, Cl. 364-426.020.
Linke, Scott L., 5,063,344, Cl. 324-115.000.

DeLine, Steven K. Router and guide apparatus. 5,062,460, Cl. 144-136.00C.

Delta Dispensing, Inc.: *See*—
Goldstein, Charles; and Glynn, Kenneth P., 5,062,551, Cl. 222-390.000.

DeLuca, Joan S.: *See*—
Erhart, Richard A.; Herold, Barry W.; and DeLuca, Joan S., 5,063,533, Cl. 395-425.000.

Demarchi, Jean-Louis: *See*—
Billet, Philippe; and Demarchi, Jean-Louis, 5,062,222, Cl. 36-2.600.

De Marchi, Olivier: *See*—
Broeck, Vanden; and De Marchi, Olivier, 5,062,858, Cl. 623-43.000.

de Mooij, Dirk B.: *See*—
Buschow, Kurt H. J.; de Mooij, Dirk B.; and Jacobs, Theodora H., 5,062,907, Cl. 148-301.000.

Demurger et cie: *See*—
Demurger, Jean P., 5,062,328, Cl. 81-186.000.

Demurger, Jean P., to Demurger et cie. Plastic wrench with metal insert. 5,062,328, Cl. 81-186.000.

Den-Tal-Ez, Inc.: *See*—
Gonser, Donald I., 5,062,797, Cl. 433-118.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Tsuyoshi, Hagio; Kobayashi, Kazuo; Yoshida, Hisayoshi; Ogawa, Ichitaro; Harada, Hiroshi; Yasunaga, Hiroaki; and Nishikawa, Hiroshi, 5,063,184, Cl. 501-96.000.

Dent, Nigel A. Telescopic beam. 5,062,245, Cl. 52-118.000.

Denton, Robert D.: *See*—
Haut, Richard C.; Thomas, Eugene R.; and Denton, Robert D., 5,062,270, Cl. 62-12.000.

Derata Corporation: *See*—
Dunlap, Kenneth W., 5,062,830, Cl. 604-68.000.

Deremo, Edwin J., to Cooper Industries, Inc. Clamping attachment for portable drills. 5,062,746, Cl. 408-79.000.

Deroux-Dauphin, Patrice, to Compagnie Europeenne de Composants Electroniques LCC. Method of manufacturing the pole pieces and the gap of magnetic heads in thin layers. 5,062,196, Cl. 29-603.000.

DeSantis, John J., to Carrier Corporation. Miswire-proof interconnecting terminal block. 5,063,314, Cl. 310-71.000.

Desorcie, Robert B.: *See*—
Cain, Michael B.; Desorcie, Robert B.; Kannabiran, Rengan; Kar, Gitimoy; and Urruti, Eric H., 5,062,685, Cl. 350-96.230.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Rohleder, Norbert; Praxl, Hubert; and Gobel-Rick, Dietrich, 5,062,458, Cl. 141-80.000.

Development Center for Biotechnology: *See*—
Chang, Ming-Ju; Hsu, Yuan-Hsun; Kuo, Mei-Hui; and Soong, Tai-Sen, 5,063,244, Cl. 514-456.000.

DeVilbiss (Canada) Limited: *See*—
Marcinkowski, John; Bennett, Herbert W.; and Niwa, Kenji, 5,062,963, Cl. 210-712.000.

de Vissser, S.: *See*—
Nieuwenhuize, O. V.; de Grunt, F.; de Vissser, S.; and Vos, R., 5,063,106, Cl. 428-343.000.

de Volder, Claude: *See*—
Bourdeau, Alain; and de Volder, Claude, 5,063,386, Cl. 342-40.000.

Dexter Corporation, The: *See*—
Robertson, Diane M.; and Byalik, Ludmila, 5,063,104, Cl. 428-286.000.

Dey, Michael J.: *See*—
Selkirk, Alastair B.; and Dey, Michael J., 5,063,220, Cl. 514-161.000.

Di Amico, Paul A. Motorized twisting pasta fork. 5,062,211, Cl. 30-322.000.

Diamond S.A.: *See*—
Marazzi, Silvio, 5,062,682, Cl. 385-85.000.

Diaz, Stephen H.: *See*—
Tomita, Akira; Diaz, Stephen H.; Dubrow, Robert S.; and Feldman, Michael, 5,062,254, Cl. 53-467.000.

DiBello, Louis M., to Owens-Illinois Plastic Products Inc. Degradable bottle and can carrier coated with ultraviolet absorber. 5,063,111, Cl. 428-411.100.

Diesel Kiki Co. L.T.D.: *See*—
Ichihashi, Koji; and Yasuma, Jun-ichi, 5,062,454, Cl. 137-625.610.

Diesel Kiki Co. Ltd.: *See*—
Peterson, Miles, 5,062,464, Cl. 160-193.000.

Dietachmayr, Harald: *See*—
Blaimschein, Gottfried; and Dietachmayr, Harald, 5,062,332, Cl. 83-74.000.

Difco Laboratories: *See*—
Wannlund, Jon C., 5,063,090, Cl. 427-384.000.

Digital Equipment Corporation: *See*—
Cutler, David N.; Orbits, David A.; Bhandarkar, Dileep; Cardoza, Wayne; and Witek, Richard T., 5,063,497, Cl. 395-800.000.
Hamadah, Talal T.; Ryder, Douglas N.; and Friedman, Harvey S., 5,063,476, Cl. 361-384.000.

Dillon, John, Jr., to Johnson & Johnson Medical, Inc. Raglan sleeve surgical gown. 5,062,160, Cl. 2-114.000.

Dillon, John R.; and O'Connor, James D., to Shipley Company Inc. Electrolytic permanganate generation. 5,062,930, Cl. 204-82.000.

Diodato, Philip W., to AT&T Bell Laboratories. Digital logic circuits for frequency multiplication. 5,063,578, Cl. 377-47.000.

DiPrima, James J.; and Porter, Frank K., Jr., to Raytheon Company. Venting and sealing mechanism. 5,062,590, Cl. 244-118.500.

Di Shang, Lian: *See*—
Jin, JiQuan; Di Shang, Lian; Jin, Guo Quan; Xu, Yong; and Luo, Guo Chun, 5,063,195, Cl. 502-341.000.

Dishart, Kenneth T.; and Wolff, Mark C., to Du Pont de Nemours, E. I., and Company. Cleaning composition of dibasic ester, hydrocarbon solvent and compatibilizing component. 5,062,988, Cl. 252-170.000.

Dittmer, Marlan A. Ventilated multiple pane skylight. 5,062,247, Cl. 52-200.000.

Dixon, George J., to Amoco Corporation. Internally-doubled, composite-cavity microlaser. 5,063,566, Cl. 372-22.000.

Dlugokecki, Andrew N., to Parker Hannifin Corporation. Commutator for orbiting gerotor-type pumps and motors. 5,062,776, Cl. 418-61.300.

DMT Marinetechnik GmbH: *See*—
Tegel, Marek, deceased; and Wenzel, Dieter, 5,062,345, Cl. 89-1.817.

Dr. Ing. h.c.F. Porsche AG: *See*—
Maier, Ulrich; and Raff, Friedrich, 5,062,314, Cl. 74-475.000.

Dodds, John F.: *See*—
Stroud, James W., III; and Dodds, John F., 5,062,785, Cl. 425-145.000.

Doheny, Anthony J., Jr., to Kendall Company, The. Preparing heat shrinkable wraps. 5,063,005, Cl. 264-22.000.

Doherty, Annette M.; Hamilton, Harriet W.; Hodges, John C.; Repine, Joseph T.; and Sircar, Ila, to Warner-Lambert Company. Renin inhibitors, method for using them, and compositions containing them. 5,063,207, Cl. 514-18.000.

Doi, Akihiko: *See*—
Yamashita, Hiroshi; and Doi, Akihiko, 5,063,548, Cl. 369-44.140.

Doi, Toshiya: *See*—
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, 5,063,200, Cl. 505-1.000.

Dolgov, Vyacheslav M.: *See*—
Aleshin, Nikolai P.; Baranov, Vladimir J.; Dolgov, Vyacheslav M.; Yarovoi, Alexandr A.; and Preobrazhensky, Oleg A., 5,062,301, Cl. 73-629.000.

Dominick, Thomas S.: *See*—
Vale, Christopher R.; Dominick, Thomas S.; Via, William R.; and Knapp, Gene P., Sr., 5,063,358, Cl. 331-60.000.

Domoto, Gerald A.; and Sereny, Aron, to Xerox Corporation. Removal of excess liquid from an image receptor. 5,063,413, Cl. 355-296.000.

Donlan, Rodney M.: *See*—
Muia, Ramon A.; and Donlan, Rodney M., 5,062,967, Cl. 210-755.000.

Donofrio, Deborah K.; and Whitekettle, Wilson K., to Betz Laboratories, Inc. Biocidal compositions and use thereof containing a synergistic mixture of n-tributyl tetradecyl phosphonium chloride and (N,N-dimethyl-N'-phenyl-N'-fluorochloromethylthio)-sulphamide. 5,063,211, Cl. 514-75.000.

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Whitekettle, Wilson K.; and Donofrio, Deborah K., 5,063,217, Cl. 514-75.000.
Whitekettle, Wilson K.; and Donofrio, Deborah K., 5,063,218, Cl. 514-75.000.

Dornier Luftfahrt GmbH: *See*—
Roth, Siegfried; Benz, Detlef; Reichle, Anton; Teske, Reiner; Zimmermann, Peter; Hager, Peter; Mueller, Josef; and Poenitzsch, Werner, 5,062,589, Cl. 244-117.00R.

Dorr, Lawrence D.; Burkinshaw, Brian D.; and Skraba, Joseph S., to Intermedics Orthopedics, Inc. Tibial prosthesis with independent medial and laterl baseplates. 5,062,852, Cl. 623-20.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Miyao, Hidehiko; Ikeda, Satoshi; Shiotsuki, Masao; Kawamura, Shigeyoshi; Komatsu, Fumiaki; Takagi, Ikuji; and Sakai, Tadamiti, 5,063,001, Cl. 264-0.500.

Dotson, Ronald L.; and Moore, Sanders H., to Olin Corporation. Process for decomposing solutions of hydroxylammonium salts. 5,062,966, Cl. 210-753.000.

Doughty, David T.; and Groose, James E., to Calgon Carbon Corporation. Chromium-free impregnated activated carbon for adsorption of toxic gases and/or vapors. 5,063,196, Cl. 502-417.000.

Doury-Berthod, Michele; and Giampaoli, Pierre, to Commissariat a l'Energie Atomique. Process for the determination of the concentration of an ionic or ionizable solute in ion exchange chromatography. 5,062,961, Cl. 210-656.000.

Dow Brands Inc.: *See*—
Smith, David A.; and LaCombe, James A., 5,062,603, Cl. 271-195.000.

Dow Chemical Company, The: *See*—
Smith, David A.; and Woody, Clark M., 5,062,623, Cl. 271-283.000.
Smith, David A.; and Geiger, Herbert B., 5,062,825, Cl. 493-194.000.

Dow Company, The: *See*—
Farquharson, Stuart; and Keillor, Peter T., III, 5,062,713, Cl. 356-402.000.

Dow Corning Corporation: *See*—
Chen, Kun-Long; and Hsu, Yung-Yu, 5,063,260, Cl. 523-213.000.
Hanneman, Larry F.; Gentle, Theresa E.; and Sharp, Kenneth G., 5,063,267, Cl. 524-284.000.
Kohl, Gretchen S.; Giwa-Agbomeirele, Patricia A.; and Vincent, Judith M., 5,063,044, Cl. 424-70.000.
Lee, Chi-Long; Lutz, Michael A.; and VanWert, Bernard, 5,063,102, Cl. 428-209.000.

DowBrands Inc.: *See*—
Smith, David A.; and Woody, Clark M., 5,062,549, Cl. 222-377.000.

Dr.Ing.h.c.F. Porsche Aktiengesellschaft: *See*—
Sommerer, Karl, 5,062,655, Cl. 280-674.000.

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Wallroth, Carl F.; Falb, Wolfgang; and Mohr, Helmut, 5,062,999, Cl. 261-39.100.

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—Mutze, Ulrich; Quanz, Gerhard; Vuong, The A.; and Kiesewetter, Wolfgang, 5,063,460, Cl. 358-474.000.
—Pierce, Zona R.; Tyagi, Dinesh; and Wilson, John C., 5,063,132, Cl. 430-109.000.
—Pritchard, Jeffrey A., 5,063,450, Cl. 358-213.280.
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Schoner, Brigitte E.; and Schoner, Ronald G., 5,063,158, Cl. 435-252.300.
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Drouet, Ludovic O.; Bal Dit Sollier, Claire; Mazoyer, Elisobeth M.; Levy Toledano, Sylviane; Jolles, Pierre; and Fiat, Ann-Taiic D., 5,063,203, Cl. 514-8.000.

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Gali, Carl E. Lead acid battery rejuvenator and charger. 5,063,341, Cl. 320-21.000.
Galkin, Benjamin M., to Thomas Jefferson University. Method and apparatus for testing radiographic film processors. 5,063,583, Cl. 378-207.000.
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—El-Hamamsy, Sayed-Amr A.; and Borowiec, Joseph C., 5,063,332, Cl. 315-248.000.
—Gibson, James J., 5,063,446, Cl. 358-142.000.
—Gluntz, Douglas M., 5,063,020, Cl. 376-371.000.
Ngo, Khai D.; and Charles, Richard J., 5,062,197, Cl. 29-606.000.
—Rasmussen, Paul C., 5,063,315, Cl. 310-71.000.
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—Smith, Lowell S.; and Piel, Edward J., Jr., 5,062,429, Cl. 128-661.010.
—Whetten, Nathan R., 5,062,690, Cl. 359-59.000.

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—Meakin, Douglas B., 5,063,086, Cl. 427-255.300.

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Buchanan, Harry C.; and Victor, Keith R., 5,062,175, Cl. 15-103.000.
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Kadle, Prasad S., 5,062,477, Cl. 165-174.000.
Kennedy, Lawrence C.; and Lambert, Harvey J., 5,062,514, Cl. 192-82.00T.
Koenig, Melissa M.; and Vukovich, William J., 5,062,321, Cl. 74-866.000.
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Smith, Stephen; and Engelhardt, Dale F., 5,062,393, Cl. 123-41.720.
Unterborn, Ralph J.; McClain, Michael J.; and Benner, Mark M., 5,062,176, Cl. 15-250.230.
Yamamoto, Mayjue A., 5,062,504, Cl. 188-79.560.

General Signal Corporation: *See*—
Carr, Daniel J.; Scally, Charles R.; McClennen, Bill M.; Carney, Michael D.; Volkoday, George; and Walsh, Thomas J., 5,063,392, Cl. 346-46.000.

Gentle, Theresa E.: *See*—
Hanneman, Larry F.; Gentle, Theresa E.; and Sharp, Kenneth G., 5,063,267, Cl. 524-284.000.

George, Kevin R.: *See*—
Wesson, David S.; and George, Kevin R., 5,062,485, Cl. 166-297.000.

Gerker, Thomas F., to Sparton Corporation. Bowline knot in a braided line. 5,062,344, Cl. 87-8.000.

Germain, Jean-Claude, to Carrar. Food pellet dispensing appliance. 5,062,543, Cl. 221-30.000.

Germanaud, Laurent; Azorin, Patrick; and Lhopital Michel, to Elf France. Sulphur-containing additives to lubricants with antiwear and extreme-pressure effect and the processes for their preparation and compositions containing the said additives. 5,062,977, Cl. 252-48.200.

Germann, Albrecht J.; Bolza-Schunemann, Hans B.; Schaede, Johannes G.; and Lapp, Joachim A. H., to De la Rue Giori S.A. Combined rotary web-fed printing machine, especially for the printing of securities. 5,062,360, Cl. 101-152.000.

Gernick, Henry R.: *See*—
Brodie, Ivor; Gernick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., 5,063,327, Cl. 313-482.000.

Gero, Thomas W.: *See*—
Cale, Albert D., Jr.; and Gero, Thomas W., 5,063,228, Cl. 574-253.000.

Gestion A. et Y. Gilbert Inc.: *See*—
Tremblay, Michel, deceased, 5,062,376, Cl. 114-230.000.

Getman, Alexandr F.: *See*—
Bakirov, Murat B.; Getman, Alexandr F.; Gribov, Boris I.; Bordjugovsky, Andrei A.; and Klimenok, Alexandra P., 5,062,293, Cl. 73-81.000.

Ghrayeb, John: *See*—
Wong-Stahl, Flossie; Chanda, Pranab K.; and Ghrayeb, John, 5,063,053, Cl. 424-89.000.

Giampaoli, Pierre: *See*—
Doury-Berthod, Michele; and Giampaoli, Pierre, 5,062,961, Cl. 210-656.000.

Gibbon, Robert M., to JMK International, Inc. Method of manufacturing elastomeric engine components. 5,063,012, Cl. 264-129.000.

Gibson, James J., to General Electric Company. Apparatus for transmitting auxiliary signal in a TV channel. 5,063,446, Cl. 358-142.000.

Gill, Manzur, to Texas Instruments Incorporated. Method of making a diffusionless virtual drain and source conductor/oxide semiconductor field effect transistor. 5,063,171, Cl. 437-41.000.

Gillemans, Johannes C. M.: *See*—
Coleman-Kammula, Seetha; and Gillemans, Johannes C. M., 5,063,088, Cl. 427-352.000.

Gillett, Jimmie D., to Ranco Incorporated of Delaware. Door ajar alarm for refrigeration unit. 5,063,372, Cl. 340-547.000.

Gilliland, Malcolm T. Apparatus and method for optimizing a welding operation. 5,063,282, Cl. 219-130.510.

Gillmore, Stephen R.; Merritt, Carleton G.; Chawan, Dhyaneshwar B.; and Matuszak, Edward A., to Borden, Inc. One-step flavored pasta products and processes for preparing fast cooking pasta products. 5,063,072, Cl. 426-557.000.

Gillot, Jacques: *See*—
Garcera, Daniel; and Gillot, Jacques, 5,062,910, Cl. 156-82.000.

Giori, Gualtiero, to De la Rue Giorgi S.A. Intaglio printing machine for the printing of currency papers. 5,062,359, Cl. 101-152.000.

Gitman, Gregory M. Aspirating combustion system. 5,062,789, Cl. 431-9.000.

Giwa-Agbomeirele, Patricia A.: *See*—
Kohl, Gretchen S.; Giwa-Agbomeirele, Patricia A.; and Vincent, Judith M., 5,063,044, Cl. 424-70.000.

Glachet, Charles, to Euritech. Telescopic manipulation arm. 5,062,761, Cl. 414-729.000.

Glaenzer Spicer: *See*—
Moulinet, Francois, 5,062,821, Cl. 464-111.000.

Glaser, Evan R.; and Shanabrook, Benjamin V., to United States of America, Navy. Heterostructure device useable as a far infrared photodetector. 5,063,419, Cl. 357-16.000.

Glassner, David A.; Jain, Mahendra K.; and Datta, Rathin. Process for the fermentative production of acetone, butanol and ethanol. 5,063,156, Cl. 435-150.000.

Glukhov, Michael, to Sabre Industries, Inc. Drain valve used in aircraft. 5,062,441, Cl. 137-81.100.

Gluntz, Douglas M., to General Electric Company. Steam-water separating construction for boiling water nuclear reactors. 5,063,020, Cl. 376-371.000.

Glynn, Kenneth P.: *See*—
Goldstein, Charles; and Glynn, Kenneth P., 5,062,551, Cl. 222-390.000.

GMF Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft: *See*—
Blaimschein, Gottfried; and Dietachmayr, Harald, 5,062,332, Cl. 83-74.000.

Gnyra, Bohdan: *See*—
Hudson, Tom J.; McIntyre, John; Tremblay, Pierre; Allaire, Claude; and Gnyra, Bohdan, 5,062,929, Cl. 204-67.000.

Go, Kouichiro: *See*—
Namimatsu, Akio; and Go, Kouichiro, 5,063,045, Cl. 424-9.000.

Gobel-Rick, Dietrich: *See*—
Rohleder, Norbert; Praxl, Hubert; and Gobel-Rick, Dietrich, 5,062,458, Cl. 141-80.000.

Goddard, Charles W.; Lucas, John T.; and Galvan, Paul A., to United States of America, Navy. Solid-propellant-powered maneuvering system for spacecraft. 5,062,593, Cl. 244-169.000.

Goddard, Georg: *See*—
Fabry, Ehrenfried; Goddard, Georg; Meyer, Dieter; Petermann, Hans; Pirkl, Bernhard; and Wiedemann, Werner, 5,063,379, Cl. 340-784.000.

Goetz, Frederick E.; Miller, Michael S.; and Shelton, Homer, Jr., to International Business Machines Corporation. Door latch for a computer housing. 5,062,671, Cl. 292-175.000.

Goetz, Norbert: *See*—
Plath, Peter; Eicken, Karl; Goetz, Norbert; Wild, Jochen; Meyer, Norbert; and Wuerzer, Bruno, 5,062,884, Cl. 71-95.000.

Goetz, Roland, to Sulzer Brothers Limited. Abrasive dental strip. 5,063,118, Cl. 428-614.000.

Goff, David L.: *See*—
Merriman, Burt T., Jr.; and Goff, David L., 5,063,115, Cl. 428-447.000.

Goforth, William R., to General Motors Corporation. Method of molding a bearing separator. 5,062,208, Cl. 29-898.049.

Gohshi, Seiichi: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

Goins, James V.; Duggan, Robert B.; Pier, William J.; and Wienhoft, Roger, to Marley Company, The. Side wall vent/air termination unit for boilers. 5,062,354, Cl. 98-62.000.

Golden Needles Knitting and Glove Co., Inc.: *See*—
Sutton, Roger I., 5,062,161, Cl. 2-169.000.

Goldschmidt, Steven H. Power-driven or manually-operated wrench puller for tightening or loosening threadedly-engaged work pieces. 5,062,326, Cl. 81-57.320.

Goldstar Co., Ltd.: *See*—
Hong, Sam P., 5,063,440, Cl. 358-85.000.

Goldstein, Charles; and Glynn, Kenneth P., to Delta Dispensing, Inc. Postless pushup container. 5,062,551, Cl. 222-390.000.

Goldstein, Mark K., to Quantum Group, Inc. Biomimetic sensor that simulates human response to airborne toxins. 5,063,164, Cl. 436-169.000.

Goldthorp, Jeffery M.; and Yeomans, James S., to Bell Communications Research, Inc. Digital signal processing relating to near-end crosstalk cable measurements. 5,063,351, Cl. 324-628.000.

Gomringer, Gary G., to InterVentional Technologies, Inc. Seal for rotating torque tube with seal valve. 5,062,648, Cl. 277-112.000.

Gonser, Donald I., to Den-Tal-Ez, Inc. Alloy bearing for dental scaler. 5,062,797, Cl. 433-118.000.

Gonzalez-Oliver, Carlos, to Battelle Memorial Institute. Method for manufacturing amorphous silica objects. 5,063,003, Cl. 264-14.000.

Goodman, James R.: *See*—
Lupton, F. Stephen; DeFilippi, Louis J.; and Goodman, James R., 5,062,956, Cl. 210-611.000.

Goodman, Meri; and Schondorf, Phyllis. Fitness and nutrition game apparatus and method of play. 5,062,645, Cl. 273-249.000.

Goodwin, Frederick K.: *See*—
Bridge, Peter; and Goodwin, Frederick K., 5,063,206, Cl. 514-16.000.

Goodyear Tire & Rubber Company, The: *See*—
Majerus, Norbert; and Rambacher, John S., 5,062,783, Cl. 425-115.000.
Rye, Grover W.; Kindry, David A.; and Weber, Carolyn T., 5,062,462, Cl. 152-548.000.

Gormley, David E.: *See*—
Oliphant, Sameul C.; and Gormley, David E., 5,062,281, Cl. 62-457.100.

Gorza, Roberto, to Nordica S.p.A. Ski boot closure device having a lever with a sliding tensioning arrangement. 5,062,225, Cl. 36-117.000.

Gorza, Roberto: *See*—
Sartor, Mariano; and Gorza, Roberto, 5,062,226, Cl. 36-117.000.

Goto, Atsuo; Okumura, Fumio; and Ito, Kazuhiko, to Mitsubishi Paper Mills Limited. Heat-sensitive recording material. 5,063,197, Cl. 503-209.000.

Goto, Toshio: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 5,062,883, Cl. 71-94.000.

Gotoh, Hiroya; and Kobayashi, Kazuo, to Jidosha Kiki Co., Ltd. Seal unit for brake booster. 5,062,348, Cl. 91-369.200.

Gotoh, Shigeyuki; Yokota, Kazunori; and Suzuki, Isao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for detecting torque of rotating shaft. 5,062,306, Cl. 73-862.330.

Gotsugi, Sigeru: *See*—
Kitagawa, Nobuhiro; and Gotsugi, Sigeru, 5,062,237, Cl. 43-86.000.

Gould, Larry D.; and Cole, David M., to United States of America, Army. Encapsulated actuator for testing of specimens. 5,062,303, Cl. 73-798.000.

Gouldsberry, Gary R.: *See*—
Fitzpatrick, Mark E.; and Gouldsberry, Gary R., 5,063,343, Cl. 323-317.000.

Grabbe, Dimitry G., to AMP Incorporated. Contact module for a low height multi-chip carrier socket. 5,062,802, Cl. 439-72.000.

Graco Inc.: *See*—
Hemming, Dale R.; Lunzer, Lawrence J.; and Lind, Robert J., 5,063,350, Cl. 324-457.000.

Graf, Carl R., to Pennsylvania Crusher Corporation. Mill screen apparatus. 5,062,601, Cl. 241-79.300.

Grafen, Paul: *See*—
Broecker, Franz J.; Arnold, Lothar; and Grafen, Paul, 5,063,194, Cl. 502-314.000.

Grafotec Kotterer GmbH: *See*—
McPherson, Malcolm; and Ernest, Reinhold, 5,062,919, Cl. 156-356.000.

Graham, John P., to Alberta Oil Sands Technology and Research Authority. Piezometer actuator device and method for its installation in a borehole. 5,062,482, Cl. 166-250.000.

Graham, Lawrence D.: *See*—
Monte, Louis H.; Jeyarajan, Arunachalam; and Graham, Lawrence D., 5,062,468, Cl. 164-122.200.
Monte, Louis H.; Jeyarajan, Arunachalam; and Graham, Lawrence D., 5,062,469, Cl. 164-122.200.

Grasso's Koninklijke Machinefabrieken N.V.: *See*—
Jansen, Halbe A., 5,062,862, Cl. 23-295.00R.

Green, David T.; Young, Wayne P.; Bolanos, Henry; Geiste, Robert J.; Ratcliff, Keith; and Alesi, Daniel E., to United States Surgical Corporation. Fascia stapler. 5,062,563, Cl. 227-176.000.

Green, Richard T. Portable blind. 5,062,234, Cl. 43-1.000.

Greenspan, D.: *See*—
Greenspan, Douglas H.; and Low, Phillip A., 5,063,062, Cl. 424-443.000.

Greenspan, Douglas H.; and Low, Phillip A., to Greenspan, D.; and Ingram, W. Cleaning compositions with orange oil. 5,063,062, Cl. 424-443.000.

Greiwe, Hansdieter, to Patzner GmbH & Co. Run-through grill with non-uniform heat distribution about the roll surface. 5,062,355, Cl. 99-349.000.

Greve Hansen, Jorn H.: *See*—
Greve Hansen, Niels F.; and Greve Hansen, Jorn H., 5,062,346, Cl. 89-14.100.

Greve Hansen, Niels F.; and Greve Hansen, Jorn H., to Dansk Industri Syndikat A/S. Heat protective covering for a pipe and a rod-shaped article, especially for gun barrels. 5,062,346, Cl. 89-14.100.

Greven, Richard. Cutting and positioning apparatus. 5,062,340, Cl. 83-95.000.

Gribov, Boris I.: *See*—
Bakirov, Murat B.; Getman, Alexandr F.; Gribov, Boris I.; Bordjugovsky, Andrei A.; and Klimenok, Alexandra P., 5,062,293, Cl. 73-81.000.

Griffith, Clifford J.: *See*—
Connolly, Kevin J.; D'Aleo, James M.; and Griffith, Clifford J., 5,062,329, Cl. 81-488.000.

Griffiths, Guy G. V.; Bolsworth, James; and Appleby, John M., to General Motors Corporation. Three link, six point hinge assembly for deck lid. 5,062,182, Cl. 16-368.000.

Griffiths, John D. Catheter for use in the surgical correction of a nasolacrimal duct obstruction. 5,062,831, Cl. 604-104.000.

Grim, Tracy E., to Royce Medical Company. Simplified orthopaedic back support. 5,062,414, Cl. 128-68.100.

Grois, Igor; and Margolin, Mark, to Molex Incorporated. Strain relief connector for optical fiber. 5,062,683, Cl. 385-87.000.

Grollier, Jean F.; Dubief, Claude; and Dupuis, Christine, to L'Oreal. Cosmetic hair-care composition based on polyorganosiloxanes containing a hydroxyalkyl functional group. 5,063,051, Cl. 424-70.000.

Grollier, Jean F.; and Dubief, Claude, to L'Oreal. Cosmetic and dermatological application of polysiloxanes containing a diester functional group and compositions employed. 5,063,052, Cl. 424-70.000.

Grollier, Jean-Francois, to L'Oreal. Dentifrice compositions having anti-caries activity and containing a polycationic polymer fluoride. 5,063,046, Cl. 424-52.000.

Groos, Horst. Horizontal metal extrusion press. 5,062,285, Cl. 72-272.000.

Groose, James E.: *See*—
Doughty, David T.; and Groose, James E., 5,063,196, Cl. 502-417.000.

Gross, Heinz; Fischer, Jens-Dieter; Siol, Werner; Sufke, Thomas; and Rhein, Thomas, to Rohm GmbH Chemische Fabrik. Impact-resistant methacrylate protective layer for polycarbonate, containing UV absorber. 5,063,112, Cl. 428-412.000.

Gross, Joseph; and Zucker, Shlomo, to Product Development (S.G.Z.) Ltd. Device for dispensing a liquid particularly useful for delivering medicaments at a predetermined rate. 5,062,834, Cl. 604-143.000.

Grossman, Emanuel. Lock monitor. 5,062,670, Cl. 292-137.000.

Grosspietsch, Wolfgang; and Scheer, Erich, to Fichtel & Sachs AG. Hub guidance for friction clutch. 5,062,513, Cl. 192-70.170.

Grotemeyer, Jurgen: *See*—
Schlag, Edward W.; Lindner, Josef; Beavis, Ronald C.; and Grotemeyer, Jurgen, 5,062,935, Cl. 204-157.410.

Gruber, William C.; and Barringer, Eric ., to Ceramics Process Systems Corporation. Metallic inks for co-sintering process. 5,062,891, Cl. 106-20.000.

Grumman Aerospace Corporation: *See*—
Curreri, Victor; Klein, John; and Dubois, Janine, 5,063,518, Cl. 364-503.000.

Gruning, Horst; and Keser, Helmut, to Asea Brown Boveri Ltd. Pressure-contacted semiconductor component. 5,063,436, Cl. 357-79.000.

Grunwald, Henry C., to ITT Corporation. Dispenser cathode with emitting surface parallel to ion flow. 5,063,324, Cl. 313-346.0DC.

Grupp, Werner: *See*—
Wieland, Dietrich; Kalb, Martin; Grupp, Werner; and Nothofer, Michael, 5,062,743, Cl. 408-6.000.

Grynaeus, Peter S.; Hollingsworth, Anthony; and Petkiewicz, Chester J., to Freudenberg Nonwovens Limited Partnership. Interlining. 5,063,101, Cl. 428-172.000.

Gsell, Laurenz, to Ciba-Geigy Corporation. Pyridyl substituted guanidines useful as insecticides. 5,063,236, Cl. 514-318.000.

GTE Products Corporation: *See*—
Anand, Vidhu; Sampath, Sanjay; Davis, Clarke D.; and Houck, David L., 5,063,021, Cl. 419-12.000.

Guaciaro, Michael A., to American Cyanamid Company. 2-(1-substituted-2-imidazolin-2-yl)benzoic and nicotinic acids and a method for their preparation. 5,062,881, Cl. 71-92.000.

Guazzoni, Luigi: *See*—
Owens, Charles R.; and Guazzoni, Luigi, 5,062,913, Cl. 156-154.000.

Gubisch, Roland W., to Beckman Industrial Corporation. Method for accurate measurement of transmission line impedance by correcting gross impedance for the "dribble-up" effect. 5,063,353, Cl. 324-710.000.

Gudaitis, Algrid M.: *See*—
Oyer, Michael W.; and Gudaitis, Algrid M., 5,063,371, Cl. 340-541.000.

Gueguin, Michel, to QIT-Fer et Titane, Inc. Method of preparing a synthetic rutile from a titaniferous slag containing magnesium values. 5,063,032, Cl. 423-84.000.

Guiberteau, Christian: *See*—
Jamet, Daniel; and Guiberteau, Christian, 5,062,804, Cl. 439-394.000.

Guillermond, Alain R.: *See*—
Allais, Jean-Philippe P. B.; Guillermond, Alain R.; and Rouyer, Pascal G., 5,062,347, Cl. 89-37.070.

Guillet, Jean-Laurent: *See*—
Terracol, Claude; Bredel, Patrick; and Guillet, Jean-Laurent, 5,062,525, Cl. 198-468.600.

Gullett, Paul D. M., to Sterling Design International. Control of 'U' tubing in the flow of cement in oil well casings. 5,062,481, Cl. 166-153.000.

Gunei Kagaku Kogyo Kabushiki Kaisha: *See*—
Arita, Yoshikazu; Iizuka, Toshi; Abe, Yukio; Nakamura, Yoshio; Takigami, Shoji; and Takigami, Machiko, 5,063,042, Cl. 423-447.400.

Gunther, Werner T., to Minnesota Mining and Manufacturing Company. Process and device for application of a carrying grip during the automatic sealing of cartons. 5,062,251, Cl. 53-134.100.

Guss, Robert J., III, to Woodhead Industries, Inc. Lighted electrical connector permitting multi directional viewing. 5,062,807, Cl. 439-490.000.

Gustafsson, Carl-Erik; and Pettersson, Bo, to C. E. Johansson AB. Absolute measurement scale system. 5,062,214, Cl. 33-706.000.

Gyobu, Ichiro: *See*—
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, 5,062,771, Cl. 417-201.000.

Haager, Ottmar: *See*—
Lenhard-Backhaus, Hugo; Ehrentraut, Otto; and Haager, Ottmar, 5,062,718, Cl. 384-294.000.

Habboosh, Samir W.: *See*—
Davis, Ray E.; Duncan, Dana L.; Habboosh, Samir W.; Hall, James R.; Nudelman, Dennis L.; and Westkamper, Michael J., 5,062,299, Cl. 73-609.000.

Hache, Jean: *See*—
Bernou, Jean-Louis; Dufau, Frederic; Geahel, Isabelle; and Hache, Jean, 5,062,965, Cl. 210-748.000.

Hackman, John A., to AMP Incorporated. Capacitive coupled connector for PCB grounding. 5,062,811, Cl. 439-620.000.

Hadden, William A.: *See*—
Bacon, Forrest C.; and Hadden, William A., 5,062,253, Cl. 53-451.000.

Haden-Schweitzer Corporation: *See*—
Best, Willie H., 5,062,788, Cl. 431-7.000.

Haga, Masakazu: *See*—
Tanaka, Hideaki; Hirata, Toichi; Sugiyama, Genroku; Haga, Masakazu; and Kajita, Yusuke, 5,062,350, Cl. 91-448.000.

Hagen, Floyd W., to Rosemount Inc. Water separator for air data sensor. 5,062,869, Cl. 55-159.000.

Hager, Peter: *See*—
Roth, Siegfried; Benz, Detlef; Reichle, Anton; Teske, Reiner; Zimmermann, Peter; Hager, Peter; Mueller, Josef; and Poenitzsch, Werner, 5,062,589, Cl. 244-117.00R.

Hagiuda, Nobuyoshi: *See*—
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Iida, Yoshikazu; Sakamoto, Hiroshi; and Matsui, Hideki, 5,063,403, Cl. 354-413.000.

Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, to BASF Aktiengesellschaft. Novel navy and black disperse dye mixtures including amino-phenyl thiophene azo disperse dye and red, yellow or orange disperse dyes. 5,062,861, Cl. 8-639.000.

Hahn, Paul: *See*—
Drazba, Martin J.; Bellek, Michael L.; Dranoff, Samuel; and Hahn, Paul, 5,062,701, Cl. 351-160.00R.

Haid, Regis, Jr.: *See*—
MacMillan, Michael; and Haid, Regis, Jr., 5,062,850, Cl. 623-17.000.

Haley, Patrick F. Practice device for golfers. 5,062,640, Cl. 273-176.00F.

Halko, David J., to Hewlett-Packard Company. Ink additives for improved ink-jet performance. 5,062,892, Cl. 106-22.000.

Halko, David J.: *See*—
Adamic, Raymond J.; Wickramanayake, Palitha; Hindagolla, Suraj L.; Radke, Garold E.; and Halko, David J., 5,062,893, Cl. 106-22.000.

Hall, David A.; and Marjancik, John R., to Rexnord Corporation. Replacement bearing for worn shafts. 5,062,720, Cl. 384-484.000.

Hall, James R.; Hunter, Lorin E.; and Wilson, Terry D., to AT&T Bell Laboratories. Modular electrical service distribution system. 5,063,473, Cl. 361-93.000.

Hall, James R.: *See*—
Davis, Ray E.; Duncan, Dana L.; Habboosh, Samir W.; Hall, James R.; Nudelman, Dennis L.; and Westkamper, Michael J., 5,062,299, Cl. 73-609.000.

Halliburton Company: *See*—
Holtmyer, Marlin D.; Hunt, Charles V.; and Harms, Weldon M., 5,062,969, Cl. 252-8.551.
Wesson, David S.; and George, Kevin R., 5,062,485, Cl. 166-297.000.

Halling, Peter J.: *See*—
Suckling, Colin J.; Halling, Peter J.; Johnston, Grant A.; and Brown, Linda, 5,063,149, Cl. 435-4.000.

Halstead, Gary A.: *See*—
Ryan, Richard P.; Shaffer, Glenn W.; Halstead, Gary A.; Smith, David M.; and Joshi, Shrikant M., 5,062,476, Cl. 165-173.000.

Hamadah, Talal T.; Ryder, Douglas N.; and Friedman, Harvey S., to Digital Equipment Corporation. Apparatus for controlled air-impingement module cooling. 5,063,476, Cl. 361-384.000.

Hamaguchi, Mikiko: *See*—
Cho, Hidetsura; Ueda, Masaru; Tamaoka, Mie; Hamaguchi, Mikiko; Murota, Seiitsu; and Morita, Ikuo, 5,063,243, Cl. 514-438.000.

Hamamoto, Hideotoshi: *See*—
Miyashita, Hiroshi; Hamamoto, Hideotoshi; Nagai, Shigeru; Yamaguchi, Makoto; Isao, Onuki; Takahashi, Hiroshi; and Ishiguro, Atsushi, 5,062,890, Cl. 106-27.000.

Hamamura, Chiyo: *See*—
Ikeda, Hideo; Hamamura, Chiyo; Satoh, Hiroshi; and Utsui, Yoshihiko, 5,062,307, Cl. 73-862.360.

Hamano, Toshikatsu: *See*—
Aoki, Yoshiharu; and Hamano, Toshikatsu, 5,062,960, Cl. 210-638.000.

Hames, Edward L.; and Howitt, Robert, to Curtis Manufacturing Company, Inc. Combined keyboard storage, monitor support and document storage shelf apparatus. 5,062,609, Cl. 248-676.000.

Hamilton, Harriet W.: *See*—
Doherty, Annette M.; Hamilton, Harriet W.; Hodges, John C.; Repine, Joseph T.; and Sircar, Ila, 5,063,207, Cl. 514-18.000.

Hamilton, Vincent E.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Mammino, Joseph; Yu, Robert C. U.; Hamilton, Vincent E.; Limburg, William W.; and Chen, Cindy, 5,063,128, Cl. 430-63.000.

Hammond, Russell E.: *See*—
Johnson, Leopold J.; and Hammond, Russell E., 5,063,487, Cl. 363-3.000.

Hammons, Alva C.; Sanders, James R.; and Ulrich, Franklin J. Yoke nut tightening wrench. 5,062,327, Cl. 81-124.300.

Hamon, Gilles: *See*—
Clemence, Francois; Frechet, Daniel; Hamon, Gilles; and Jouquey, Simone, 5,063,225, Cl. 514-211.000.

Hampton, Leslie E.; and Thompson, David F., to Corning Incorporated. Preparation of ceramic honeycomb structure having selectively sealed channels. 5,062,911, Cl. 156-89.000.

Han, Benjamin C.: *See*—
Black, Raymond J.; and Han, Benjamin C., 5,062,503, Cl. 188-71.500.

Hanatani, Yasuyuki: *See*—
Nakatani, Kaname; Hanatani, Yasuyuki; and Mizuta, Yasufumi, 5,063,126, Cl. 430-59.000.

Haneda, Satoshi; Fukuchi, Masakazu; Matsuo, Shunji; and Morita, Shizuo, to Konica Corporation. Color image forming apparatus having a unitary guide plate facing a plurality of developing devices. 5,063,411, Cl. 355-212.000.

Hanejko, Francis G.: *See*—
Rutz, Howard; and Hanejko, Francis G., 5,063,011, Cl. 264-126.000.

Hanneman, Larry F.; Gentle, Theresa E.; and Sharp, Kenneth G., to Dow Corning Corporation. Hydrogen silsesquioxane resin fractions and their use as coating materials. 5,063,267, Cl. 524-284.000.

Hannigan, Judson, to Champion International Corporation. Single tiered multi-cylinder paper dryer apparatus. 5,062,216, Cl. 34-16.000.

Hansen, Guenter: *See*—
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 5,062,861, Cl. 8-639.000.

Hansen, Henry; Studsgaard, Leif; and Laursen, Erik, to Danfoss A/S. Method of making a measuring tube for an electromagnetic flow meter, and the measuring tube. 5,062,305, Cl. 73-861.120.

Hanssler, Gerd: *See*—
Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 5,063,241, Cl. 514-383.000.

Hant, William: *See*—
Tully, John W.; O'Brien, Benedict B.; Hant, William; and Hu, King L., 5,063,427, Cl. 357-35.000.

Hapyo Yugen Kaisha: *See*—
Ohtsuka, Hiroshi, 5,062,435, Cl. 132-108.000.

Hara, Shinichi: *See*—
Mori, Tetsuzo; Sakamoto, Eiji; Hara, Shinichi; Uda, Koji; Shimoda, Isamu; Uzawa, Shunichi; and Ozawa, Kunitaka, 5,063,582, Cl. 378-34.000.

Harada, Hiroshi: *See*—
Tsuyoshi, Hagio; Kobayashi, Kazuo; Yoshida, Hisayoshi; Ogawa, Ichitaro; Harada, Hiroshi; Yasunaga, Hiroaki; and Nishikawa, Hiroshi, 5,063,184, Cl. 501-96.000.

Harada, Kosuke; and Sakamoto, Hiroshi, to Kyushu University. Switching power source means. 5,063,488, Cl. 363-16.000.

Harada, Masazumi: *See*—
Takamura, Toshiyuki; Kurihashi, Kazunari; and Harada, Masazumi, 5,062,545, Cl. 221-152.000.

Harada, Nozomu: *See*—
Shibata, Hidenori; Inoue, Ikuko; and Harada, Nozomu, 5,063,449, Cl. 358-213.110.

Harada, Takashi: *See*—
Mizuno, Hiroshige; Abe, Fumio; and Harada, Takashi, 5,063,029, Cl. 422-175.000.

Harada, Toshiaki: *See*—
Yanagisawa, Ryozo; Tanioka, Hiroshi; Kaneko, Kiyoshi; Harada, Toshiaki; Yoshikawa, Kikuo; Koumura, Noboru; and Inui, Toshiharu, 5,063,451, Cl. 346-143.000.

Hardenbrook, James M.; Williams, Richard E.; and Daniel, Mark L., to Minnesota Mining and Manufacturing Company. Apparatus for detecting fluorescence of a luminescent material. 5,063,297, Cl. 250-458.100.

Hargis, I. Glen; Fabris, Hubert J.; Wilson, John A.; and Livigni, Russell A., to GenCorp Inc. Anionic initiator system for polymerizing monomers. 5,063,190, Cl. 502-157.000.

Haring, Werner: *See*—
Ross, Carl H.; Machat, Rudolf; Haring, Werner; and Lettenbauer, Gustav, 5,062,959, Cl. 210-635.000.

Harjunmaa, Hannu: *See*—
Partanen, Paul; Seppanen, Helena; and Harjunmaa, Hannu, 5,063,024, Cl. 422-65.000.

Harmon, Thomas D.; and Morrison, Kenneth G., to International Paper Company. Apparatus and method for producing semi-converted diskette liners. 5,062,582, Cl. 242-56.400.

Harms, Weldon M.: *See*—
Holtmyer, Marlin D.; Hunt, Charles V.; and Harms, Weldon M., 5,062,969, Cl. 252-8.551.

Harrel, Charlena: *See*—
McArthur, James R.; Harrel, John; and Mayberry, John, 5,062,756, Cl. 414-22.510.

Harrel, John: *See*—
McArthur, James R.; Harrel, John; and Mayberry, John, 5,062,756, Cl. 414-22.510.

Harris, Edward H. Illuminated artificial flowers. 5,063,485, Cl. 362-122.000.

Harris, James E., to Amoco Corporation. Stabilized poly(aryl ether ketone) compositions. 5,063,265, Cl. 524-126.000.

Harris, James I. Copy machine remover of paper clips and staples. 5,062,672, Cl. 294-65.500.

Harris, Robert D.; and Putnam, Brett J., to Speed Queen Company. Air flow apparatus for clothes dryer. 5,062,219, Cl. 34-133.000.

Harrisburg, Inc.: *See*—
Johnson, Jerry E., 5,062,452, Cl. 137-533.250.

Hart, Michael G.: *See*—
Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., 5,062,703, Cl. 356-73.100.

Harth, Hubert: *See*—
Carduck, Franz-Josef; Wuest, Willi; Harth, Hubert; and Liebs, Harald, 5,062,997, Cl. 260-400.000.

Haruta, Yasumasa, to Mitsubishi Denki Kabushiki Kaisha. Escalator system with convertible step unit. 5,062,519, Cl. 190-333.000.

Hasegawa, Akira; Mori, Hiroshi; Takahashi, Tatsuhiko; and Sano, Yasuyuki, to G-C Toshi Kogyo Corporation. Photopolymerizable type resin compositions for dental purposes. 5,063,255, Cl. 522-96.000.

Hasegawa, Yoshitomo; and Tsuchiya, Teruyuki, to SMC Corporation. Gas filter element. 5,062,864, Cl. 55-495.000.

Hashimoto, Nobuo; Suzuki, Kunioki; and Saijo, Teruaki, to 501 Toray Industries, Inc. Method of measuring a profile of an object and an apparatus for carrying out the method. 5,062,297, Cl. 73-597.000.

Hashimoto, Shinichi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, 5,063,246, Cl. 514-517.000.

Hashimoto, Shuichi, to Fujitsu Limited. Automatic adjustment method and system for servo motor circuit of a magnetic disk apparatus. 5,063,454, Cl. 360-78.040.

Haskel, Inc.: *See*—
Kelly, John W., 5,062,199, Cl. 29-727.000.

Hatano, Tsuyoshi: *See*—
Sato, Hideki; Mizunoya, Nobuyuki; Asai, Hironori; Anzai, Kazuo; and Hatano, Tsuyoshi, 5,063,121, Cl. 428-698.000.

Hatton, Bruce M., to Eaton Corporation. Servo operated valve assembly. 5,062,611, Cl. 251-129.110.

Hattori, Hitoshi; Sakata, Hirotsugu; Hayano, Makoto; Okuda, Masayuki; and Morozumi, Naoya, to Kabushiki Kaisha Toshiba. Helical blade type compressor with thurst loss compensation. 5,062,778, Cl. 418-220.000.

Hattori, Masateru: *See*—
Tsuge, Kazuto; Hattori, Masateru; Kondo, Kazuo; and Shibata, Yoshimasa, 5,062,798, Cl. 433-201.100.

Haug, Edward W., to Pfauter-MAAG Cutting Tools Limited Partnership. Angular interlock for the replaceable wafer of a shaper cutter. 5,062,742, Cl. 407-28.000.

Hauser, George M.: *See*—
Maitz, Carlos A.; and Hauser, George M., 5,062,835, Cl. 604-153.000.

Hausmann, Herbert, to Binder & Co. Aktiengesellschaft. Deformable sieve mat screening apparatus having raised sieve mat rims. 5,062,949, Cl. 209-310.000.

Haut, Richard C.; Thomas, Eugene R.; and Denton, Robert D., to Exxon Production Research Company. Method and apparatus to start-up controlled freezing zone process and purify the product stream. 5,062,270, Cl. 62-12.000.

Hayano, Makoto: *See*—
Hattori, Hitoshi; Sakata, Hirotsugu; Hayano, Makoto; Okuda, Masayuki; and Morozumi, Naoya, 5,062,778, Cl. 418-220.000.

Hayase, Shuzi: *See*—
Horiguchi, Rumiko; Hayase, Shuzi; and Onishi, Yasunobu, 5,063,134, Cl. 430-192.000.

Hayashi, Hiroshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material capable of being processed at ultrahigh speed and process for the formation of color images using thereof. 5,063,139, Cl. 430-377.000.

Hayashi, Kenzo: *See*—
Sakai, Hiroshi; Asai, Masamichi; Hayashi, Kenzo; Sakurai, Kazunori; and Watanabe, Kazuhiko, 5,062,554, Cl. 222-600.000.

Hayashi, Minoru; Matsufuji, Mitoshi; Takahashi, Sakae; Kamiji, Koichi; Kobari, Kouichi; Kishimoto, Junichi; Shioda, Michio; and Kawaguchi, Masaaki, to Nippon Koki, Co., Ltd. Air bag inflation gas generator. 5,062,367, Cl. 102-530.000.

Hayashi, Shigeki, to Shimadzu Corporation. Electron-optical system for making a pseudoparallel micro electron-beam. 5,063,296, Cl. 250-396.0ML.

Hayashi, Shoichi: *See*—
Takeshima, Akira; Asakura, Toshikazu; Takahashi, Akihiko; Kobayashi, Shigeo; and Hayashi, Shoichi, 5,062,491, Cl. 173-12.000.

Hayashi, Yoshiaki, to Yoshino Kogyosho Co., Ltd. Bottle-shaped container with base cap. 5,062,537, Cl. 215-12.100.

Hayduk, John. Fast-learning neural network system for adaptive pattern recognition apparatus. 5,063,601, Cl. 382-14.000.

Hayes, Richard A.; Kosinski, Leonard E. R.; and Wagman, Mark E., to Du Pont de Nemours, E. I., and Company. Polyacetal compositions containing a non-meltable polymer stabilizer improved with a minor amount of at least one meltable co-stabilizer and at least one primary antioxidant. 5,063,263, Cl. 524-101.000.

Hayes, Ronald: *See*—
Aldersley, Alan; and Hayes, Ronald, 5,062,596, Cl. 244-234.000.

Haynes International, Inc.: *See*—
Sridhar, Narasi, 5,063,023, Cl. 420-442.000.

Headley, Philip M.; and Kulkarni, Prakash K., to General Motors Corporation; and Delco Electronics Corp. ABS yaw control. 5,063,514, Cl. 364-426.020.

Health Research, Inc.: *See*—
Potter, William R., 5,062,431, Cl. 128-665.000.

Heck, Karl R.: *See*—
Jamoua, Saad A.; Sarnowsky, Melvin J.; and Heck, Karl R., 5,063,516, Cl. 364-431.110.

Heck, Werner: *See*—
Astheimer, Hans; Brumme, Helma; Heck, Werner; Kissel, Klaus; and Schuy, Hubert, 5,063,464, Cl. 360-104.000.

Hedderick, John B.; Rutty, Brian R.; Page, David G.; and Walshe, John J., to Arthur Guinness Son and Company (Great Britian) Limited. Beverage dispensing system. 5,062,548, Cl. 222-190.000.

Heiml, Roland: *See*—
Sticht, Walter; and Heiml, Roland, 5,062,368, Cl. 104-172.300.

Heinrich, Jurgen: *See*—
Neff, Franz H.; and Heinrich, Jurgen, 5,062,584, Cl. 244-3.150.

Heitmann, Erric L.; and Shaw, David N., to Carrier Corporation. Combined oil heater and level sensor. 5,062,277, Cl. 62-193.000.

Hekal, Ihal M. Peelably sealed plastic packages and method of preparing same. 5,062,569, Cl. 229-3.50R.

Hekker, Roeland M.T.; and Livny, Ishak M., to Du Pont de Nemours, E. I., and Company. Image converter. 5,063,442, Cl. 358-93.000.

Helton, Arch W. Method and apparatus for watering potted plants. 5,062,239, Cl. 47-79.000.

HEM Research, Inc.: *See*—
Carter, William A., 5,063,209, Cl. 514-44.000.

Hemming, Dale R.; Lunzer, Lawrence J.; and Lind, Robert J., to Graco Inc. Electrostatic spray gun voltage and current monitor. 5,063,350, Cl. 324-457.000.

Hendricks, Kenneth J. Game data board. 5,062,381, Cl. 116-225.000.

Henkel Corporation: *See*—
Lindert, Andreas; Pierce, John R.; and McCormick, David R., 5,063,089, Cl. 427-354.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Carduck, Franz-Josef; Wuest, Willi; Harth, Hubert; and Liebs, Harald, 5,062,997, Cl. 260-400.000.

Henri, Jean-Claude: *See*—
Gault, Dominique; Andrieu, Jean-Pierre; and Henri, Jean-Claude, 5,063,388, Cl. 342-185.000.

Herman, Frederick L.; Savoca, Ann C. L.; and Listemann, Mark L., to Air Products and Chemicals, Inc. Preparation of metallated and substituted alkynes. 5,062,998, Cl. 260-665.00R.

Herman, Philip A.; and McCarthy, William F., to International Business Machines Corporation. Suppression of electrical interferences from an electronic circuit. 5,063,362, Cl. 333-12.000.

Herold, Barry W.: *See*—
Erhart, Richard A.; Herold, Barry W.; and DeLuca, Joan S., 5,063,533, Cl. 395-425.000.

Heubel, Walter. Spout for different size cans. 5,062,552, Cl. 222-570.000.

Hewlett-Packard Company: *See*—
Adamic, Raymond J.; Wickramanayake, Palitha; Hindagolla, Suraj L.; Radke, Garold E.; and Halko, David J., 5,062,893, Cl. 106-22.000.
Halko, David J., 5,062,892, Cl. 106-22.000.
McKeown, Nicholas W., 5,063,612, Cl. 455-607.000.
Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., 5,062,703, Cl. 356-73.100.

Heyn, Bennington R.; and Gartner, Joseph, Jr. Exercising device. 5,062,628, Cl. 272-75.000.

Higaki, Yuzo: *See*—
Yoneyama, Masakazu; Yamada, Ryosuke; Nishiura, Yosuke; Maekawa, Yukio; Higaki, Yuzo; and Iwamoto, Yoshiaki, 5,063,147, Cl. 430-523.000.

Higgins, Larry: *See*—
Kennedy, Earl W.; Oexman, Robert D.; and Higgins, Larry, 5,062,169, Cl. 5-449.000.
Higurashi, Seiji, to Victor Company of Japan Ltd. Magnetic recording and/or reproducing apparatus having means for preventing audio-to-video crosstalk and noise generation. 5,063,452, Cl. 360-19.100.
Hildebrand, Thomas, to Huels Aktiengesellschaft. Polymeric costabilizers for molding compositions based on polymers of vinyl chloride. 5,063,262, Cl. 524-97.000.
Hill, James A.; and Burtch, John E., to Owens-Illinois Plastic Products Inc. Thermoplastic cup and method and apparatus for making. 5,062,568, Cl. 229-1.50B.
Hillenius, Steven J.; Lebowitz, Joseph; Liu, Ruichen; and Lynch, William T., to AT&T Bell Laboratories. Devices having shallow junctions. 5,063,422, Cl. 357-23.300.
Hilsenbeck, Henry; and Muck, Jack E., to Hilsenbeck, Henry. Double action check valve. 5,062,448, Cl. 137-498.000.
Hindagolla, Suraj L.: *See*—
Adamic, Raymond J.; Wickramanayake, Palitha; Hindagolla, Suraj L.; Radke, Garold E.; and Halko, David J., 5,062,893, Cl. 106-22.000.
Hindley, Richard M., to Beecham Group p.l.c. Novel compounds. 5,063,240, Cl. 514-369.000.
Hiner, Roger N.: *See*—
Abreu, Mary E.; Rzeszotarski, Waclaw; Kyle, Donald J.; Hiner, Roger N.; and Elliott, Richard L., 5,063,245, Cl. 514-404.000.
Hirabayashi, Satoshi: *See*—
Kiyonari, Toshiyuki; Hirabayashi, Satoshi; Kidokoro, Naoto; and Takimoto, Futoshi, 5,063,137, Cl. 430-292.000.
Hirahara, Ziro; and Abe, Akihito, to Kabushiki Kaisha Toshiba. Data processing device with direct memory access function processed as an micro-code vectored interrupt. 5,063,498, Cl. 395-425.000.
Hirano, Isao: *See*—
Kawashima, Ichiro; Seki, Mitsuo; and Hirano, Isao, 5,062,279, Cl. 62-235.000.
Hirata, Toichi: *See*—
Tanaka, Hideaki; Hirata, Toichi; Sugiyama, Genroku; Haga, Masakazu; and Kajita, Yusuke, 5,062,350, Cl. 91-448.000.
Hirata, Toshio; Ogura, Kenji; and Mizutani, Takehito, to Nippondenso Co., Ltd. Automotive air conditioner. 5,062,275, Cl. 62-174.000.
Hirose, Kazonori: *See*—
Nishio, Yukio; and Hirose, Kazonori, 5,062,385, Cl. 118-653.000.
Hirose, Takeshi; Abe, Akira; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Process for forming color image. 5,063,143, Cl. 430-419.000.
Hirose, Toshifumi: *See*—
Yukimoto, Sadao; Hirose, Toshifumi; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 5,063,270, Cl. 524-306.000.
Hirota, Kazuo: *See*—
Akahane, Shoji; Tosaki, Satoshi; Kusayanagi, Yukiharu; Kusakai, Shigenobu; Hirota, Kazuo; and Tomioka, Kentaro, 5,063,257, Cl. 523-116.000.
Hirota, Kusato; Ohbayashi, Gentaro; and Nakanishi, Toshiharu, to Toray Industries, Inc. Optical recording medium. 5,063,097, Cl. 428-65.000.
Hirsch, Mark J., to Xerox Corporation. Development apparatus using an electromagnet to prevent development in the non-operative mode. 5,063,412, Cl. 355-259.000.
Hishinuma, Takashi: *See*—
Fukushima, Takashi; and Hishinuma, Takashi, 5,063,458, Cl. 358-335.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
Tanaka, Hideaki; Hirata, Toichi; Sugiyama, Genroku; Haga, Masakazu; and Kajita, Yusuke, 5,062,350, Cl. 91-448.000.
Hitachi Koki Co., Ltd.: *See*—
Takeda, Fumio; Yoshida, Takashi; Taguchi, Hiroya; Omine, Tsutomu; and Asano, Mitsugu, 5,062,723, Cl. 400-120.000.
Hitachi, Ltd.: *See*—
Akimoto, Hajime; Ozaki, Toshifumi; Tokumasu, Kazuya; Ono, Hideyuki; and Tanaka, Haruhiko, 5,063,581, Cl. 377-58.000.
Horiuchi, Tadasu; Nishijima, Hideo; and Ohno, Shoji, 5,063,456, Cl. 358-310.000.
Kambara, Hideki; Nishikawa, Tetsuo; Sumitani, Tomoaki; Nagai, Keiichi; and Ito, Yoshitoshi, 5,062,942, Cl. 204-299.00R.
Miura, Haruo; Fukushima, Yasuo; Nishida, Hideo; Kobayashi, Hiromi; and Takagi, Takeo, 5,062,766, Cl. 415-199.100.
Nakata, Toshihiko; and Kembo, Yukio, 5,062,715, Cl. 356-432.000.
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, 5,063,200, Cl. 505-1.000.
Okamoto, Yukio, 5,063,329, Cl. 315-111.210.
Okuyama, Kousuke, 5,063,170, Cl. 437-41.000.
Owashi, Hitoaki; Ohtsubo, Hiroyasu; Sekiya, Masataka; Minabe, Kohji; Nishijima, Hideo; Masuda, Michio; and Rokuda, Morito, 5,063,437, Cl. 358-22.000.
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, 5,062,771, Cl. 417-201.000.
Takeda, Fumio; Yoshida, Takashi; Taguchi, Hiroya; Omine, Tsutomu; and Asano, Mitsugu, 5,062,723, Cl. 400-120.000.
Watanabe, Takashi; and Ishizuka, Tatsuro, 5,063,320, Cl. 310-270.000.
Yoda, Haruo; Miyatake, Takafumi; and Matsushima, Hitoshi, 5,063,492, Cl. 364-167.010.
Hitachi Medical Corp.: *See*—
Kondo, Shin-ichi; Katakura, Kageyoshi; and Ikeda, Hiroshi, 5,063,541, Cl. 367-7.000.
Hitachi Metals, Ltd.: *See*—
Matsumoto, Shunichiro; Inui, Tsutomu; Ichiyasu, Rokuo; and Chiba, Yoshitaka, 5,062,885, Cl. 75-255.000.
Uchida, Norimasa, 5,063,116, Cl. 428-606.000.
Hitachi Tokyo Electronics Co. Ltd.: *See*—
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, 5,062,771, Cl. 417-201.000.
Hitt, Otis H. Supplementary impact device for a golf club. 5,062,639, Cl. 273-171.000.
Hiwatashi, Yutaka: *See*—
Kamimura, Katsuyoshi; Mine, Atsushi; and Hiwatashi, Yutaka, 5,063,512, Cl. 364-424.050.
Hiyama, Takayuki: *See*—
Katsuragi, Kohei; and Hiyama, Takayuki, 5,062,736, Cl. 404-72.000.
Ho, W. S. Winston, to Exxon Research and Engineering Co. Polymeric membrane and process for separation of aliphatically unsaturated hydrocarbons. 5,062,866, Cl. 55-16.000.
Hobson, Gregory L.; Luetkemeyer, Kent; and Wootton, John R., to Electronics & Space Corporation. Missile tracking, guidance and control apparatus. 5,062,586, Cl. 244-3.120.
Hockman, Edward N., to Clyde Corporation. Article orienting apparatus. 5,062,521, Cl. 198-389.000.
Hodges, John C.: *See*—
Doherty, Annette M.; Hamilton, Harriet W.; Hodges, John C.; Repine, Joseph T.; and Sircar, Ila, 5,063,207, Cl. 514-18.000.
Hoeganaes Corporation: *See*—
Rutz, Howard; and Hanejko, Francis G., 5,063,011, Cl. 264-126.000.
Hoffman, Allan C. Method and apparatus for fabricating a seamless hollow rubber core for a ball. 5,062,912, Cl. 156-145.000.
Hoffmann-La Roche Inc.: *See*—
Kiefer, Hansruedi, 5,063,162, Cl. 435-270.000.
Schildknecht, Eugene G.; and Untawale, Govind G., 5,063,219, Cl. 514-157.000.
Hofmeister, Peter: *See*—
Leyendecker, Joachim; Kuenast, Christoph; and Hofmeister, Peter, 5,063,232, Cl. 514-247.000.
Hogan, Martin A.: *See*—
Hogan, Martin J.; and Hogan, Martin A., 5,063,346, Cl. 324-173.000.
Hogan, Martin J.; and Hogan, Martin A., to General Motors Corporation. Wheel speed sensor for remote installation. 5,063,346, Cl. 324-173.000.
Hogarth, Ian W.; and Kiewning, Friedhelm, to Franz Buettner AG. Typewriter or printer ribbon and method for its manufacture. 5,062,725, Cl. 400-195.000.
Hohl, Frank; and Breckwoldt, Jorn, to Wolff Walsrode AG. Process for the preparation of hydrocolloid mixtures having improved dispersibility. 5,062,889, Cl. 106-197.200.
Holbrook, Russell W.; and MacDonald, Scott A., to Pitney Bowes Inc. Replaceable belt cartridge for an envelope feed apparatus. 5,062,600, Cl. 271-35.000.
Holdeman, Louis B.: *See*—
Geller, Bernard D.; Tyler, Johann U.; Holdeman, Louis B.; Phelleps, Fred R.; and Laird, George F., III, 5,063,177, Cl. 437-209.000.
Holland, Christopher E.: *See*—
Brodie, Ivor; Gernick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., 5,063,327, Cl. 313-482.000.
Hollandse Signaalapparaten B.V.: *See*—
Reits, Bernard J., 5,063,389, Cl. 342-359.000.
Hollingsworth, Anthony: *See*—
Grynaeus, Peter S.; Hollingsworth, Anthony; and Petkiewicz, Chester J., 5,063,101, Cl. 428-172.000.
Holmes, Paul E., to Olin Corporation. Identification, characterization, and method of production of a novel microbial lipase. 5,063,160, Cl. 435-253.300.
Holmwood, Graham: *See*—
Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 5,063,241, Cl. 514-383.000.
Holt, Debra S.: *See*—
Holt, John N.; and Holt, Debra S., 5,062,840, Cl. 604-385.100.
Holt, John N.; and Holt, Debra S. Disposable diapers. 5,062,840, Cl. 604-385.100.
Holtmyer, Marlin D.; Hunt, Charles V.; and Harms, Weldon M., to Halliburton Company. Crosslinkable interpolymers. 5,062,969, Cl. 252-8.551.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Konno, Mitsuo; Noro, Hisashi; and Katsura, Naotero, 5,063,278, Cl. 219-86.100.
Nakayama, Hiroshi; and Yumoto, Toshiyuki, 5,062,822, Cl. 475-200.000.
Takeshima, Akira; Asakura, Toshikazu; Takahashi, Akihiko; Kobayashi, Shigeo; and Hayashi, Shoichi, 5,062,491, Cl. 173-12.000.
Honda, Kazuo: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, 5,063,246, Cl. 514-517.000.

Honda, Minoru: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

Honda, Ryoji; Kita, Masahiro; and Negoro, Ikuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrophotographic printer using a continuous-form recording sheet. 5,063,416, Cl. 355-316.000.

Honeywell Inc.: *See*—
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Samad, Tariq, 5,063,605, Cl. 382-44.000.

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Hostetler, Robert D., to Avtron, Inc. Bracket filler for animal watering device. 5,062,391, Cl. 119-72.000.

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Ishida, Jun'ichi: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

Ishida, Toshio; Ushimaru, Akira; and Nishikawa, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium comprising a fluorine containing oligomer surfactant in or on the magnetic layer. 5,063,119, Cl. 428-694.000.

Ishiguro, Atsushi: *See*—
Miyashita, Hiroshi; Hamamoto, Hideotoshi; Nagai, Shigeru; Yamaguchi, Makoto; Isao, Onuki; Takahashi, Hiroshi; and Ishiguro, Atsushi, 5,062,890, Cl. 106-27.000.

Ishii, Kazuo: *See*—
Kato, Eiichi; and Ishii, Kazuo, 5,063,130, Cl. 439-96.000.

Ishii, Yoshiki: *See*—
Fukuzawa, Keiichi; and Ishii, Yoshiki, 5,063,470, Cl. 360-137.000.

Ishikawa Gasket Co., Ltd.: *See*—
Udagawa, Tsunekazu, 5,062,649, Cl. 277-235.00B.

Ishikawa, Hisashi; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, to Canon Kabushiki Kaisha. Wide-band video signal recording apparatus by using frequency interleave. 5,063,457, Cl. 358-330.000.

Ishikawa, Masao: *See*—
Kuse, Satoru; Ishikawa, Masao; Koboshi, Shigeharu; Ishikawa, Minoru; and Yagi, Toshihiko, 5,063,140, Cl. 430-393.000.

Ishikawa, Minoru: *See*—
Kuse, Satoru; Ishikawa, Masao; Koboshi, Shigeharu; Ishikawa, Minoru; and Yagi, Toshihiko, 5,063,140, Cl. 430-393.000.

Ishikawa, Tadashi, to Kabushiki Kaisha Toshiba. Method of adding-/subtracting floating-point representation data and apparatus for the same. 5,063,530, Cl. 364-748.000.

Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Process for processing silver halide color photographic materials. 5,063,142, Cl. 430-400.000.

Ishikawa, Yasuhiro: *See*—
Sakamoto, Katsuhiko; Kawaguchi, Akira; and Ishikawa, Yasuhiro, 5,062,809, Cl. 439-581.000.

Ishizuka, Tatsuro: *See*—
Watanabe, Takashi; and Ishizuka, Tatsuro, 5,063,320, Cl. 310-270.000.

Ishizuka, Tazuko: *See*—
Marui, Masatoshi; Inage, Tomonori; Matsui, Yuji; and Ishizuka, Tazuko, 5,062,692, Cl. 359-45.000.

Isied, Stephan S.: *See*—
Kuehn, Christa G.; Rossi, Debra J.; and Isied, Stephan S., 5,063,151, Cl. 435-7.330.

Isoda, Chuzo: *See*—
Fujita, Takeshi; Isoda, Chuzo; and Aketa, Kazuyo, 5,062,986, Cl. 252-134.000.

Isono, Kunihiro: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 5,062,883, Cl. 71-94.000.

Itabashi, Akihisa, to Ricoh Company, Ltd. *fθ* Lens system in optical scanner. 5,062,679, Cl. 359-206.000.

Itak, Jeanne: *See*—
Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; and Wieck, Henry J., 5,063,081, Cl. 427-2.000.

Ito Corporation: *See*—
Ito, Tatsuharu, 5,063,025, Cl. 422-100.000.

Ito, Kazuhiko: *See*—
Goto, Atsuo; Okumura, Fumio; and Ito, Kazuhiko, 5,063,197, Cl. 503-209.000.

Ito, Kazuo: *See*—
Yamada, Yoshimi; Ito, Kazuo; and Tanimoto, Hideo, 5,063,508, Cl. 364-419.000.

Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, to Mitsubishi Denki Kabushiki Kaisha. Optic disc with servo pattern and apparatus for accessing the optical disc. 5,063,546, Cl. 369-32.000.

Ito, Saburo, to Sanshin Kogyo Kabushiki Kaisha. Vessel running information display control system. 5,063,381, Cl. 340-984.000.

Ito, Tatsuharu, to Ito Corporation. Analytical microsyringe with a superelastic plunger. 5,063,025, Cl. 422-100.000.

Ito, Yoshitoshi: *See*—
Kambara, Hideki; Nishikawa, Tetsuo; Sumitani, Tomoaki; Nagai, Keiichi; and Ito, Yoshitoshi, 5,062,942, Cl. 204-299.00R.

ITT Corporation: *See*—
Grunwald, Henry C., 5,063,324, Cl. 313-346.0DC.

ITW Plastiglide: *See*—
Johnson, John I., 5,063,274, Cl. 174-158.00F.

Ivankovits, John C.: *See*—
Ellison, Thomas L.; Roberts, David A.; Ivankovits, John C.; and Norman, John A. T., 5,062,902, Cl. 148-23.000.

Iverson, Robert A.: *See*—
Engel, Timothy S.; and Iverson, Robert A., 5,062,633, Cl. 272-132.000.

Ivett, Peter R.: *See*—
Edmonson, David A.; Ivett, Peter R.; Johnson, Kenneth E.; Mirzamaani, Seyyed M. T.; and Ward, James F., Jr., 5,063,120, Cl. 428-694.000.

Iwadate, Yuichi: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

Iwamoto, Yoshiaki: *See*—
Yoneyama, Masakazu; Yamada, Ryosuke; Nishiura, Yosuke; Maekawa, Yukio; Higaki, Yuzo; and Iwamoto, Yoshiaki, 5,063,147, Cl. 430-523.000.

Iwasaki, Satoshi, to Minolta Camera Kabushiki Kaisha. Zoom lens system for use in a microfilm projection apparatus. 5,062,695, Cl. 359-689.000.

Iwata, Toshio, to Mitsubishi Denki K.K. Apparatus for detecting pressure in cylinder of internal combustion engine. 5,062,294, Cl. 73-115.000.

IXYS Corporation: *See*—
Zommer, Nathan, 5,063,307, Cl. 307-310.000.

Iyengar, Narasimhan, to Texas Instruments Incorporated. Integrated circuit with improved on-chip power supply control. 5,063,304, Cl. 307-296.600.

Izaki, Masataka: *See*—
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 5,062,696, Cl. 359-554.000.

Izawa, Tatsuo: *See*—
Imamura, Saburo; and Izawa, Tatsuo, 5,062,680, Cl. 385-131.000.

Izumi, Tetsuji: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 5,062,883, Cl. 71-94.000.

Izumi, Yoshinori: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

J. I. Case Company: *See*—
Lykken, Thomas G.; and Kemper, Philip T., 5,062,316, Cl. 74-529.000.

J. M. Voith GmbH: *See*—
Ortner, Herbert; and Pfalzer, Lothar, 5,062,964, Cl. 210-740.000.

Jacob, Peter G.: *See*—
Barrow, Ross; Elias, Martin C.; Lyons, Peter R. A.; Jacob, Peter G.; and Rashleigh, Scott C., 5,062,686, Cl. 385-33.000.

Jacobowitz, Judah L.: *See*—
Humble, John D.; Searles, Raymond C.; Ruggles, John D.; and Jacobowitz, Judah L., 5,063,028, Cl. 422-144.000.
Jacobs, Craig W.; and Filion, Joseph L., to Xerox Corporation. Programming conflict identification system for reproduction machines. 5,063,535, Cl. 395-575.000.
Jacobs, Howard S., to Nordisk Gentofte A/S. Process for treating infertility. 5,063,204, Cl. 514-8.000.
Jacobs, Theodora H.: *See*—
Buschow, Kurt H. J.; de Mooij, Dirk B.; and Jacobs, Theodora H., 5,062,907, Cl. 148-301.000.
Jade Systems, Inc.: *See*—
Eaton, David K., 5,062,310, Cl. 73-866.500.
Jaeger, Marc J., to University of Florida. Heat transfer system without mass transfer. 5,062,471, Cl. 165-8.000.
Jaen-Guardia, Ernest, Jr.: *See*—
Dau, William S.; and Jaen-Guardia, Ernest, Jr., 5,062,631, Cl. 272-123.000.
Jaffray, Ian; and Bronskill, John F., to Imageware Research and Development Inc. Apparatus and method for transforming a digitized signal of an image. 5,063,448, Cl. 358-160.000.
Jaggard, Dwight L.; and Engheta, Nader, to University of Penn., The Trustees of the. Method of measuring chiral parameters of a chiral material. 5,063,391, Cl. 343-703.000.
Jain, Mahendra K.: *See*—
Glassner, David A.; Jain, Mahendra K.; and Datta, Rathin, 5,063,156, Cl. 435-150.000.
Jakub, Beatrice. Patient's hospital gown. 5,062,159, Cl. 2-114.000.
James, James A.: *See*—
Berglund, Andrew; James, James A.; and Easley, James B., 5,062,816, Cl. 440-101.000.
James, Paul; Kuemmel, Theodore J.; Wurm, Michael G.; Banach, James D.; and Fulton, David, to LaBelle Industries, Inc. Method and apparatus for monitoring personal core temperature. 5,062,432, Cl. 128-736.000.
Jamet, Daniel; and Guiberteau, Christian, to ALCATEL CIT. Metal housing for an electrical connector. 5,062,804, Cl. 439-394.000.
Jamison, Russell D.; Brumfield, David; and Treharne, Richard, to Smith & Nephew Richards Inc. Method and apparatus for the fixation of bone fractures, limb lengthening and the correction of deformities. 5,062,844, Cl. 606-54.000.
Jamoua, Saad A.; Sarnowsky, Melvin J.; and Heck, Karl R., to Ford Motor Company. Smart power driver system for a motor vehicle. 5,063,516, Cl. 364-431.110.
Janke, Lance N.: *See*—
Rudnick, Alan S.; and Janke, Lance N., 5,062,526, Cl. 206-6.100.
Janome Sewing Machine Co. Ltd.: *See*—
Orii, Akira; and Watanabe, Haruhisa, 5,063,339, Cl. 318-696.000.
Jansen, Frank; and Chen, Inan, to Xerox Corporation. Variable-thickness imaging members. 5,063,397, Cl. 346-153.100.
Jansen, Halbe A., to Grasso's Koninklijke Machinefabrieken N.V. Process and apparatus for recovering a pure substance from a liquid mixture by crystallization. 5,062,862, Cl. 23-295.00R.
Japan Aviation Electronics Industry, Limited: *See*—
Ohno, Akira; Muraoka, Kunihiko; and Nakazato, Wataru, 5,062,806, Cl. 439-490.000.
Okada, Kenichi; Nishino, Masashi; and Tanigawa, Shu, 5,062,710, Cl. 356-350.000.
Japan Tobacco Inc.: *See*—
Chuman, Tatsuji; and Ono, Mikio, 5,063,058, Cl. 424-405.000.
Sagawa, Takayoshi; Tani, Shichisei; and Kato, Katsuo, 5,062,522, Cl. 198-400.000.
Jarrett, Paul: *See*—
Burges, Denis H.; and Jarrett, Paul, 5,063,055, Cl. 424-93.000.
Jasinski, Joseph E.; Lingle, Charles H.; Pollitt, Richard F.; and Shuman, David W., to Lexmark International, Inc. Combined mouse and trackball. 5,063,289, Cl. 250-221.000.
Jaspers, Martinus J.: *See*—
Horikx, Cornelis M.; and Jaspers, Martinus J., 5,062,920, Cl. 156-380.400.
Jay, Eric C.; and Nordquist, Michael H., to Jay Medical, Ltd. Wheelchair back system. 5,062,677, Cl. 297-444.000.
Jay Medical, Ltd.: *See*—
Jay, Eric C.; and Nordquist, Michael H., 5,062,677, Cl. 297-444.000.
Jenkins, Robert A. Container recycling apparatus. 5,062,540, Cl. 220-23.830.
Jenkins, Robert H., Jr.: *See*—
Migdal, Cyril A.; and Jenkins, Robert H., Jr., 5,062,980, Cl. 252-51.50A.
Jensen, Jon: *See*—
Dalebout, William T.; and Jensen, Jon, 5,062,626, Cl. 272-69.000.
Jensen, Thomas H., to PPG Industries, Inc. Method and apparatus for forming round glass fibers. 5,062,876, Cl. 65-1.000.
Jewell, Tanya E.; and Rodgers, J. Michael, to AT&T Bell Laboratories. Apparatus for semiconductor lithography. 5,063,586, Cl. 378-34.000.
Jeyarajan, Arunachalam: *See*—
Monte, Louis H.; Jeyarajan, Arunachalam; and Graham, Lawrence D., 5,062,468, Cl. 164-122.200.
Monte, Louis H.; Jeyarajan, Arunachalam; and Graham, Lawrence D., 5,062,469, Cl. 164-122.200.
Jidosha Denki Kogyo K.K.: *See*—
Watanuki, Yoshio; Mochida, Haruo; Inoue, Masaru; Suzuki, Kazuya; and Tanaka, Masaki, 5,062,312, Cl. 74-89.140.
Jidosha Kiki Co., Ltd.: *See*—
Gotoh, Hiroya; and Kobayashi, Kazuo, 5,062,348, Cl. 91-369.200.
Jin, Guo Quan: *See*—
Jin, JiQuan; Di Shang, Lian; Jin, Guo Quan; Xu, Yong; and Luo, Guo Chun, 5,063,195, Cl. 502-341.000.
Jin, JiQuan; Di Shang, Lian; Jin, Guo Quan; Xu, Yong; and Luo, Guo Chun, to China Petrochemical Corporation; and Beijing China Research Institute of Beijing Yanshan Petrochemical Corporation. High efficiency silver catalyst for the production of ethylene oxide via ethylene oxidation. 5,063,195, Cl. 502-341.000.
Jitsukawa, Masaharu: *See*—
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,062,906, Cl. 148-111.000.
JMK International, Inc.: *See*—
Gibbon, Robert M., 5,063,012, Cl. 264-129.000.
Jodoin, Dominique, to Telefonaktiebolaget L M Ericsson. Toll ticketing record generation for billing of intersystem handoff calls in a mobile telephone system. 5,063,591, Cl. 379-115.000.
Johenning, John B., to Strata Flotation, Inc. Waterbed mattress and corner structure with tethered insert. 5,062,170, Cl. 5-450.000.
John D. Brush & Co., Inc.: *See*—
Legge, Richard C.; and Arp, George F., 5,063,094, Cl. 428-35.700.
Johnson, Bartley C.: *See*—
Chandrasekhar, S.; and Johnson, Bartley C., 5,063,426, Cl. 357-30.000.
Johnson, Brian Keith A.: *See*—
Patsiokas, Stelios J.; Johnson, Brian Keith A.; and Audet, Pierre E., 5,063,588, Cl. 379-57.000.
Johnson, Douglas C.: *See*—
Shekleton, Jack R.; and Johnson, Douglas C., 5,062,262, Cl. 60-39.360.
Johnson, Gary E.; and Eckert, Richard M., to Strippit, Inc. Indexable multi-tool for punch press. 5,062,337, Cl. 83-552.000.
Johnson, Gerald E.: *See*—
Nguyen, Dat; Sansevero, Frank; Johnson, Gerald E.; and Rivera, James A., 5,062,520, Cl. 198-335.000.
Johnson, Gregory K., to Innova Products, Inc. Adjustable shoe covering. 5,062,223, Cl. 36-7.10R.
Johnson, Jerry E., to Harrisburg, Inc. Valve member and method of making such a member. 5,062,452, Cl. 137-533.250.
Johnson, John I., to ITW Plastiglide. Electric fence insulator. 5,063,274, Cl. 174-158.00F.
Johnson & Johnson Medical, Inc.: *See*—
Dillon, John, Jr., 5,062,160, Cl. 2-114.000.
Dyer, John; Mathews, Grace; and Major, Matthew M., 5,062,418, Cl. 128-156.000.
Johnson, Kenneth E.: *See*—
Edmonson, David A.; Ivett, Peter R.; Johnson, Kenneth E.; Mirzamaani, Seyyed M. T.; and Ward, James F., Jr., 5,063,120, Cl. 428-694.000.
Johnson, Kevin M.: *See*—
Zeman, Robert E.; and Johnson, Kevin M., 5,063,399, Cl. 346-160.100.
Johnson, Leopold J.; and Hammond, Russell E., to United States of America, Navy. Main and auxiliary transformer rectifier system for minimizing line harmonics. 5,063,487, Cl. 363-3.000.
Johnson Pump AB: *See*—
Carlsson, Ulf, 5,062,777, Cl. 418-104.000.
Johnston, Grant A.: *See*—
Suckling, Colin J.; Halling, Peter J.; Johnston, Grant A.; and Brown, Linda, 5,063,149, Cl. 435-4.000.
Jolles, Pierre: *See*—
Drouet, Ludovic O.; Bal Dit Sollier, Claire; Mazoyer, Elisobeth M.; Levy Toledano, Sylviane; Jolles, Pierre; and Fiat, Ann-Taiic D., 5,063,203, Cl. 514-8.000.
Jones, Joel W.; and Eldracher, John, to Tri-Way Machine Ltd. Transfer apparatus for moving pallets using hydraulic lift. 5,062,188, Cl. 29-33.00P.
Jones, Richard L., to Conoco Inc. Hot melt wax compositions. 5,063,271, Cl. 524-351.000.
Jones, Winton D.: *See*—
Sunkara, Sai P.; and Jones, Winton D., 5,063,238, Cl. 514-340.000.
Jordan, John D., Jr., to AT&T Bell Laboratories. Information control system for selectively transferring a tree lock from a parent node to a child node thereby freeing other nodes for concurrent access. 5,063,501, Cl. 395-725.000.
Jordan, John D., Jr., to AT&T Bell Laborabories. Information control system for counting lock application against composite information infrastructure. 5,063,502, Cl. 395-725.000.
Jordan, John D., Jr., to AT&T Bell Laboratories. Information control system for selectively locking an entity with requested intermediate reserve exclusive and share locks. 5,063,503, Cl. 395-725.000.
Jordan, John D., Jr., to AT&T Bell Laboratories. Information control system for reserve locking infrastructure nodes for subsequent exclusive and share locking by the system. 5,063,504, Cl. 395-725.000.
Joshi, Shrikant M., to General Motors Corporation. Oil cooler. 5,062,474, Cl. 165-109.100.
Joshi, Shrikant M.: *See*—
Ryan, Richard P.; Shaffer, Glenn W.; Halstead, Gary A.; Smith, David M.; and Joshi, Shrikant M., 5,062,476, Cl. 165-173.000.
Jouquey, Simone: *See*—
Clemence, Francois; Frechet, Daniel; Hamon, Gilles; and Jouquey, Simone, 5,063,225, Cl. 514-211.000.
Jowett, Peter. Raney catalyst composition. 5,063,189, Cl. 502-150.000.
Juki Corporation: *See*—
Kichizo, Maeno; Arai, Junpei; and Aso, Hideo, 5,062,373, Cl. 112-113.000.

Junier, Marius R., to Triten Corporation. Water cooled gate valve. 5,062,445, Cl. 137-340.000.

Jupiter Telescope Co., Inc.: *See*—
d'Autume, Georges, 5,062,699, Cl. 359-430.000.

Jurgens, Gunter; Surig, Udo; and Lang, Lothar, to Daimler-Benz AG. Process for the adaptive control of an internal-combustion engine and/or another drive component of a motor vehicle. 5,063,510, Cl. 364-424.100.

Jursich, Gregory M.: *See*—
Leondaridis, Paul S.; Von Drasek, William A.; and Jursich, Gregory M., 5,063,035, Cl. 423-241.000.

K. J. Manufacturing: *See*—
Bedi, Ram D.; and van der Griendt, Adrianus J., 5,062,398, Cl. 123-196.00R.

Kabelsky, Mikhail, to Bartizan Corporation. Credit card imprinter with one-piece slider. 5,062,361, Cl. 101-269.000.

Kabushiki Kaisha Asahi Denshi Kenkyujyo: *See*—
Wakura, Shinji, 5,063,380, Cl. 340-825.540.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kawata, Yutaka; Inoue, Ken-ichi; Ishibashi, Kiyotaka; Kobayashi, Akira; Inoue, Koji; Suzuki, Norio; Arai, Akio; Yamada, Kaneo; Tokushige, Keizo; Fukuyama, Hirofumi; Adachi, Shigeto; Furukawa, Yukito; Takahashi, Sunao; and Kimura, Makoto, 5,063,294, Cl. 250-309.000.
Miyao, Hidehiko; Ikeda, Satoshi; Shiotsuki, Masao; Kawamura, Shigeyoshi; Komatsu, Fumiaki; Takagi, Ikuji; and Sakai, Tadamiti, 5,063,001, Cl. 264-0.500.
Sawamura, Seishi; Nakajima, Sakuya; Amemori, Kunio; Oku, Hidehisa; Nakagawa, Akio; Kitayama, Ichiro; Matsuda, Hiromu; Yoshida, Katsuhiko; Takeda, Masaru; Nakane, Toshio; Horiguchi, Shiro; and Yuki, Shigeru, 5,062,856, Cl. 623-24.000.
Yoshimatsu, Hideaki, 5,062,266, Cl. 60-466.000.

Kabushiki Kaisha Tominaga Jyushi Kobyosho: *See*—
Tominaga, Kazutoshi, 5,062,951, Cl. 210-169.000.

Kabushiki Kaisha Toshiba: *See*—
Emoto, Takao, 5,063,434, Cl. 357-72.000.
Fujioka, Masahiko, 5,063,465, Cl. 360-104.000.
Hattori, Hitoshi; Sakata, Hirotsugu; Hayano, Makoto; Okuda, Masayuki; and Morozumi, Naoya, 5,062,778, Cl. 418-220.000.
Hirahara, Ziro; and Abe, Akihito, 5,063,498, Cl. 395-425.000.
Horiguchi, Rumiko; Hayase, Shuzi; and Onishi, Yasunobu, 5,063,134, Cl. 430-192.000.
Ishikawa, Tadashi, 5,063,530, Cl. 364-748.000.
Kishimoto, Hitoshi, 5,062,592, Cl. 244-164.000.
Kuhara, Shigehide; and Satoh, Kozo, 5,063,348, Cl. 324-307.000.
Matsuo, Kenji; Nonaka, Tadashi; and Tsuchiya, Ikuo, 5,063,433, Cl. 357-71.000.
Mori, Shojiro, 5,063,430, Cl. 357-45.000.
Nagato, Hitoshi, 5,063,394, Cl. 346-76.0PH.
Ohashi, Takayoshi, 5,063,565, Cl. 371-40.200.
Ohshima, Yohichi, 5,063,431, Cl. 357-54.000.
Okazaki, Kiyoshi, 5,062,412, Cl. 128-24.0EL.
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 5,062,271, Cl. 62-55.500.
Sakuta, Shigeru; and Ueda, Katsunobu, 5,062,712, Cl. 356-400.000.
Sato, Hideki; Mizunoya, Nobuyuki; Asai, Hironori; Anzai, Kazuo; and Hatano, Tsuyoshi, 5,063,121, Cl. 428-698.000.
Sato, Mitsuo, 5,063,031, Cl. 422-245.000.
Seo, Yasutsugu; and Sugawara, Motoaki, 5,062,427, Cl. 128-661.100.
Shibata, Hidenori; Inoue, Ikuko; and Harada, Nozomu, 5,063,449, Cl. 358-213.110.
Sugiyama, Akiyoshi, 5,062,278, Cl. 62-230.000.
Sunada, Satoru, 5,063,284, Cl. 219-497.000.
Uehara, Shouji, 5,063,594, Cl. 380-15.000.
Yamamuro, Mikio, 5,063,549, Cl. 369-44.280.
Yamashita, Hiroshi; and Doi, Akihiko, 5,063,548, Cl. 369-44.140.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Gotoh, Shigeyuki; Yokota, Kazunori; and Suzuki, Isao, 5,062,306, Cl. 73-862.330.
Okamoto, Tsukasa; and Ohta, Shuji, 5,062,494, Cl. 180-132.000.

Kabushiki Kaisha Toyoda Jidoshokku Seisakusho: *See*—
Kawai, Katsunori; Ikeda, Hayato; Yokomachi, Naoya; and Kawai, Toshihiro, 5,062,773, Cl. 417-269.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Mimura, Nobuharu, 5,062,673, Cl. 294-111.000.

Kabushikigaisha Toyo Seisakusho: *See*—
Kawashima, Ichiro; Seki, Mitsuo; and Hirano, Isao, 5,062,279, Cl. 62-235.000.

Kadaba, Bharath K.: *See*—
Barzilai, Tsipora P.; Chen, Mon-Song; Kadaba, Bharath K.; and Kaplan, Marc A., 5,063,562, Cl. 370-94.100.

Kadle, Prasad S., to General Motors Corporation. High efficiency heat exchanger with divider rib leak paths. 5,062,477, Cl. 165-174.000.

Kadokura, Kenzi: *See*—
Sugita, Shuichi; Mizukura, Noboru; Kohno, Junichi; Kadokura, Kenzi; and Tomotake, Atsushi, 5,063,148, Cl. 430-551.000.

Kaempf, Karl: *See*—
Zahner, Paul; and Kaempf, Karl, 5,062,547, Cl. 222-144.500.

Kagawa, Koichi; Yu, Chung-Li; Kaku, Shinkyo; and Menon, Vinod, to Advanced Micro Devices, Inc. Bit map rotation processor. 5,063,526, Cl. 395-155.000.

Kageyama, Shubei; Kageyama, Toshihiko; Nakazato, Youichi; and Mitsuya, Yoshihide, to Kotobuki & Co., Ltd. Writing tool. 5,062,727, Cl. 401-52.000.

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Kageyama, Shubei; Kageyama, Toshihiko; Nakazato, Youichi; and Mitsuya, Yoshihide, 5,062,727, Cl. 401-52.000.

Kahn, Marvin L.; and O'Mahony, John S., to Rich Products Corporation. Low fat low cholesterol milk products. 5,063,074, Cl. 426-585.000.

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Kubo, Tsutomu; Terao, Kazuo; Yamamuro, Takashi; Kajimoto, Masashi; and Tsukagoshi, Kazuhiko, 5,063,133, Cl. 430-122.000.

Kajino, Jirou: *See*—
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 5,062,696, Cl. 359-554.000.

Kajita, Yusuke: *See*—
Tanaka, Hideaki; Hirata, Toichi; Sugiyama, Genroku; Haga, Masakazu; and Kajita, Yusuke, 5,062,350, Cl. 91-448.000.

Kakimoto, Toshihiko; and Murakami, Takuya, to Nissan Motor Company, Limited. Bush assembly. 5,062,654, Cl. 280-673.000.

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Wieland, Dietrich; Kalb, Martin; Grupp, Werner; and Nothofer, Michael, 5,062,743, Cl. 408-6.000.

Kalenowsky, John A., to Motorola, Inc. Capacitive power supply having charge equalization circuit. 5,063,340, Cl. 320-1.000.

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Kambara, Hideki; Nishikawa, Tetsuo; Sumitani, Tomoaki; Nagai, Keiichi; and Ito, Yoshitoshi, to Hitachi, Ltd. Fluorescence detection type electrophoresis apparatus. 5,062,942, Cl. 204-299.00R.

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Kamiji, Koichi: *See*—
Hayashi, Minoru; Matsufuji, Mitoshi; Takahashi, Sakae; Kamiji, Koichi; Kobari, Kouichi; Kishimoto, Junichi; Shioda, Michio; and Kawaguchi, Masaaki, 5,062,367, Cl. 102-530.000.

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Nambu, Toshiro; Kawaguchi, Hirotoshi; Furukawa, Hisao; and Kato, Yasushi, 5,063,114, Cl. 428-447.000.
Nomura, Takuji; Miki, Shogo; Sakauchi, Takashi; Sato, Yoshitaka; and Honma, Yuusuke, 5,062,981, Cl. 252-62.540.
Yukimoto, Sadao; Hirose, Toshifumi; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 5,063,270, Cl. 524-306.000.

Kaneko, Kiyoshi: *See*—
Yanagisawa, Ryozo; Tanioka, Hiroshi; Kaneko, Kiyoshi; Harada, Toshiaki; Yoshikawa, Kikuo; Koumura, Noboru; and Inui, Toshiharu, 5,063,451, Cl. 346-143.000.

Kaneko, Yukio: *See*—
Tomii, Hiroyasu; and Kaneko, Yukio, 5,062,730, Cl. 403-57.000.

Kaneko, Yutaka, to Ricoh Company, Ltd. Line image sensor with plural elements arranged at a predetermined pitch according to thermal expansion. 5,063,286, Cl. 250-208.100.

Kang, Mi Y.: *See*—
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Cain, Michael B.; Desorcie, Robert B.; Kannabiran, Rengan; Kar, Gitimoy; and Urruti, Eric H., 5,062,685, Cl. 350-96.230.

Kao Corporation: *See*—
Kamegai, Jun; and Arisawa, Masatoshi, 5,062,989, Cl. 252-174.170.

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Miller, Brian S.; and Kaplan, David R., 5,062,203, Cl. 29-852.000.
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Barzilai, Tsipora P.; Chen, Mon-Song; Kadaba, Bharath K.; and Kaplan, Marc A., 5,063,562, Cl. 370-94.100.

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Lautenschlager, Karl, Jr., 5,062,180, Cl. 16-257.000.

Karlsson, Roger S. Device at a filter hose. 5,062,873, Cl. 55-302.000.

Karol, Thomas J., to R. T. Vanderbilt Company, Inc. Fuel compositions containing polyalkylated 1,3,4-thiadiazoles. 5,062,863, Cl. 44-341.000.

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Miwa, Hiroshi; Miyoshi, Atuko; Satou, Syungi; and Kaseda, Masayuki, 5,063,528, Cl. 364-559.000.

Kaser, Peter: *See*—
Gabathuler, Jean-Pierre; Eckert, Karl-Ludwig; Kaser, Peter; Maurer, Albert; and Fischer, Anton, 5,063,007, Cl. 264-44.000.

Kashida, Motokazu: *See*—
Yoshimura, Katsuji; Aoki, Akio; Shimokoriyama, Makoto; Kashida, Motokazu; Yamashita, Shinichi; and Nagasawa, Kenichi, 5,063,453, Cl. 360-32.000.

Katagiri, Shoichi: *See*—
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,063,551, Cl. 369-48.000.

Katahara, Keith W.: *See*—
Petermann, Steven G.; Katahara, Keith W.; and Wolcott, Herbert A., II, 5,063,542, Cl. 367-166.000.

Katakura, Kageyoshi: *See*—
Kondo, Shin-ichi; Katakura, Kageyoshi; and Ikeda, Hiroshi, 5,063,541, Cl. 367-7.000.

Katano, Tatsuya: *See*—
Murai, Hiroaki; Katano, Tatsuya; and Kikuchi, Shigeki, 5,063,398, Cl. 346-157.000.

Kataoka, Kenichi; Nishimoto, Yoshifumi; and Igaki, Masahiko, to Canon Kabushiki Kaisha. Vibratory sheet feeder which uses phase adjustment to control the sheet feeding speed. 5,062,622, Cl. 271-270.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive material. 5,063,130, Cl. 439-96.000.

Kato, Katsuo: *See*—
Sagawa, Takayoshi; Tani, Shichisei; and Kato, Katsuo, 5,062,522, Cl. 198-400.000.

Kato, Takahiko: *See*—
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, 5,063,200, Cl. 505-1.000.

Kato, Yasushi: *See*—
Nambu, Toshiro; Kawaguchi, Hirotoshi; Furukawa, Hisao; and Kato, Yasushi, 5,063,114, Cl. 428-447.000.

Katsumata, Haruo; Sakai, Hiromichi; Takahashi, Keisuke; Ootaguro, Hirofumi; Matsumoto, Masashi; Nakamura, Moriyasu; and Ando, Tatsuo, to Mitsubishi Kasei Corporation. Carbon fiber-reinforced hydraulic composite material. 5,062,897, Cl. 106-696.000.

Katsura, Naotero: *See*—
Konno, Mitsuo; Noro, Hisashi; and Katsura, Naotero, 5,063,278, Cl. 219-86.100.

Katsuragi, Kohei; and Hiyama, Takayuki, to Nihon Chikasui Kaihatsu Kabushiki Kaisha. Snow melting method utilizing heat retaining function of underground aquifer without sprinkling water. 5,062,736, Cl. 404-72.000.

Katun Corporation: *See*—
Meagher, Brian R., 5,062,580, Cl. 242-125.200.

Kawada, Hitoshi: *See*—
Ohtsubo, Toshiro; Tsuda, Shigenori; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 5,063,059, Cl. 424-408.000.

Kawaguchi, Akira: *See*—
Sakamoto, Katsuhiko; Kawaguchi, Akira; and Ishikawa, Yasuhiro, 5,062,809, Cl. 439-581.000.

Kawaguchi, Hiroshi: *See*—
Maeda, Takeshi; Kawaguchi, Hiroshi; Yamaguchi, Harukazu; Sakai, Hitoshi; Ando, Akio; Matsushita, Yasuo; and Takemoto, Tetsuya, 5,062,926, Cl. 202-183.000.

Kawaguchi, Hirotoshi: *See*—
Nambu, Toshiro; Kawaguchi, Hirotoshi; Furukawa, Hisao; and Kato, Yasushi, 5,063,114, Cl. 428-447.000.

Kawaguchi, Katsuhiko: *See*—
Nuita, Akira; and Kawaguchi, Katsuhiko, 5,063,395, Cl. 346-76.0PH.

Kawaguchi, Masaaki: *See*—
Hayashi, Minoru; Matsufuji, Mitoshi; Takahashi, Sakae; Kamiji, Koichi; Kobari, Kouichi; Kishimoto, Junichi; Shioda, Michio; and Kawaguchi, Masaaki, 5,062,367, Cl. 102-530.000.

Kawai, Katsunori; Ikeda, Hayato; Yokomachi, Naoya; and Kawai, Toshihiro, to Kabushiki Kaisha Toyoda Jidoshokku Seisakusho. Swash plate type refrigerant compressor with a separator of refrigerant gas and lubricant oil. 5,062,773, Cl. 417-269.000.

Kawai, Norio: *See*—
Yamada, Yasuhiko; Tomio, Minaki; Miyamae, Toshiyuki; and Kawai, Norio, 5,062,618, Cl. 267-140.400.

Kawai, Shigeru; and Kubota, Keiichi, to NEC Corporation. Optical neural net trainable in rapid time. 5,063,531, Cl. 395-25.000.

Kawai, Tatsundo: *See*—
Nakagawa, Katsumi; Kawai, Tatsundo; and Kuroda, Yasuo, 5,063,462, Cl. 358-475.000.

Kawai, Toshihiro: *See*—
Kawai, Katsunori; Ikeda, Hayato; Yokomachi, Naoya; and Kawai, Toshihiro, 5,062,773, Cl. 417-269.000.

Kawakami, Tetsuji: *See*—
Imai, Akihiro; Kawakami, Tetsuji; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, 5,063,198, Cl. 503-227.000.

Kawakita, Hiroaki: *See*—
Samejima, Kazuo; and Kawakita, Hiroaki, 5,062,258, Cl. 56-202.000.

Kawamura, Shigeyoshi: *See*—
Miyao, Hidehiko; Ikeda, Satoshi; Shiotsuki, Masao; Kawamura, Shigeyoshi; Komatsu, Fumiaki; Takagi, Ikuji; and Sakai, Tadamiti, 5,063,001, Cl. 264-0.500.

Kawashima, Ichiro; Seki, Mitsuo; and Hirano, Isao, to Kabushikigaisha Toyo Seisakusho; and Marubeni Kabushikigaisha. Artificial snowfall system. 5,062,279, Cl. 62-235.000.

Kawata, Yutaka; Inoue, Ken-ichi; Ishibashi, Kiyotaka; Kobayashi, Akira; Inoue, Koji; Suzuki, Norio; Arai, Akio; Yamada, Kaneo; Tokushige, Keizo; Fukuyama, Hirofumi; Adachi, Shigeto; Furukawa, Yukito; Takahashi, Sunao; and Kimura, Makoto, to Kabushiki Kaisha Kobe Seiko Sho. Converged ion beam apparatus. 5,063,294, Cl. 250-309.000.

Kawazoe, Tetsu; and Iida, Tsukasa, to Mitsui Petrochemical Industries, Ltd. Mercury removal from liquid hydrocarbon compound. 5,062,948, Cl. 208-251.00R.

Kay Seven Co., Ltd.: *See*—
Tomii, Hiroyasu; and Kaneko, Yukio, 5,062,730, Cl. 403-57.000.

Kaylor, Jannette G.: *See*—
Kaylor, Joseph B., 5,062,996, Cl. 252-610.000.

Kaylor, Joseph B., to Kaylor, Jannette G. Methods and compositions for sorbing flammable liquids. 5,062,996, Cl. 252-610.000.

Kazda, Stanislav: *See*—
Schwenner, Eckhard; Stegelmeier, Hartmut; Kazda, Stanislav; and Knorr, Andreas, 5,063,239, Cl. 514-357.000.

Keate, Christopher R.: *See*—
Arbanas, Glenn A.; Thornock, Jeffery M.; and Keate, Christopher R., 5,063,577, Cl. 375-120.000.

Keilhack, Hans O. Textile fabric dryer and method. 5,062,220, Cl. 34-155.000.

Keillor, Peter T., III: *See*—
Farquharson, Stuart; and Keillor, Peter T., III, 5,062,713, Cl. 356-402.000.

Kellett, George W., to Creative Products Resource Associates, Ltd. Stearate-based dryer-added fabric modifier sheet. 5,062,973, Cl. 252-8.750.

Kelley, Wayne R.: *See*—
Aufderheide, Brian E.; Robrecht, Michael J.; and Kelley, Wayne R., 5,062,916, Cl. 156-269.000.

Kelly, John W., to Haskel, Inc. Apparatus for radially expanding and anchoring sleeves within tubes. 5,062,199, Cl. 29-727.000.

Kembo, Yukio: *See*—
Nakata, Toshihiko; and Kembo, Yukio, 5,062,715, Cl. 356-432.000.

Kemp, James R., to Advanced Graphics Technologies, Inc. Oscillating printing press roller having a plurality of separate annular pistons. 5,062,362, Cl. 101-348.000.

Kemp, Richard A., to Shell Oil Company. Sulfiding of hydrogel derived catalysts. 5,062,947, Cl. 208-216.00R.

Kemper, Philip T.: *See*—
Lykken, Thomas G.; and Kemper, Philip T., 5,062,316, Cl. 74-529.000.

Kendall Company, The: *See*—
Doheny, Anthony J., Jr., 5,063,005, Cl. 264-22.000.
Wendell, Amy M., 5,062,836, Cl. 604-167.000.

Kennedy, Christopher R.: *See*—
Dwivedi, Ratnesh K.; and Kennedy, Christopher R., 5,063,185, Cl. 501-126.000.

Kennedy, Clinton R.: *See*—
Apelian, Minas R.; and Kennedy, Clinton R., 5,062,943, Cl. 208-59.000.

Kennedy, Earl W.; Oexman, Robert D.; and Higgins, Larry, to Leggett & Platt, Incorporated. Clinical bed. 5,062,169, Cl. 5-449.000.

Kennedy, James L.: *See*—
Candland, Calvin T.; Christianson, Kim L.; Kennedy, James L.; Smith, David A.; Nosan, Francis J.; and Overend, Steven F., 5,062,366, Cl. 102-430.000.

Kennedy, Lawrence C.; and Lambert, Harvey J., to General Motors Corporation. Insulating retainer for a viscous fluid clutch. 5,062,514, Cl. 192-82.00T.

Kennedy, Michael R., to Aaxon Industrial, Inc. Method and apparatus for unloading mobile vacuum loaders. 5,062,868, Cl. 55-97.000.

Kephart, Alan R., to United States of America, Energy. Electrochemical polishing of thread fastener test specimens of nickel-chromium iron alloys. 5,062,931, Cl. 204-129.700.

Keri, Jozsef, to Akkumulator-Es Szarazelemgyar. Process for the preparation of active-mass of improved quality from active-mass wastes formed during the production of lead accumulators. 5,062,574, Cl. 241-22.000.

Kerr, David T.: *See*—
Rankin, Russel J.; de Chastel, David J., deceased; Wescombe, Graeme L.; Kerr, David T.; Boyce, Phillip R.; White, Raymond M.; Tritchler, Robert W.; and Buhot, John W., 5,062,820, Cl. 452-187.000.

Kerr, Harry D. Bedside toilet incorporating overhead hoist. 5,062,165, Cl. 4-480.000.

Kersey, Alan D., to United States of America, Navy. All-optical fiber faraday rotation current sensor with heterodyne detection technique. 5,063,290, Cl. 250-227.170.

Kersten, Ralf T.: *See—*
Ackermann, Ulrich; Kersten, Ralf T.; Etzkorn, Heinz-Werner; Paquet, Volker; and Rutze, Uwe, 5,062,508, Cl. 118-723.000.

Keser, Helmut: *See—*
Gruning, Horst; and Keser, Helmut, 5,063,436, Cl. 357-79.000.

Keur, Robert I.: *See—*
Clark, James E.; and Keur, Robert I., 5,063,393, Cl. 346-75.000.

Keytec, Inc.: *See—*
Sun, Brian Y., 5,062,198, Cl. 29-622.000.

Khalid, Najeeb A.; Adams, Larry; Schwartz, Stan; and Wong, Jean, to Escher-Grad Incorporated. Motorized sheet film cartridge. 5,063,408, Cl. 355-72.000.

Khan, Farooq A., to Baroid Technology, Inc. Fluid economizer control valve system for blowout preventers. 5,062,349, Cl. 91-436.000.

Khandros, Igor Y.: *See—*
Huang, Wu-Song; Khandros, Igor Y.; Saraf, Ravi; and Shi, Leathen, 5,062,896, Cl. 106-287.190.

Kichizo, Maeno; Arai, Junpei; and Aso, Hideo, to Juki Corporation. Button transferring device. 5,062,373, Cl. 112-113.000.

Kidokoro, Naoto: *See—*
Kiyonari, Toshiyuki; Hirabayashi, Satoshi; Kidokoro, Naoto; and Takimoto, Futoshi, 5,063,137, Cl. 430-292.000.

Kiefer, Hansruedi, to Hoffmann-La Roche Inc. Process for isolating nucleic acids utilizing protease digestion. 5,063,162, Cl. 435-270.000.

Kiesewetter, Wolfgang: *See—*
Mutze, Ulrich; Quanz, Gerhard; Vuong, The A.; and Kiesewetter, Wolfgang, 5,063,460, Cl. 358-474.000.

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Hogarth, Ian W.; and Kiewning, Friedhelm, 5,062,725, Cl. 400-195.000.

Kigami, Hiroyuki: *See—*
Tanita, Takeo; Kigami, Hiroyuki; and Azuma, Yusaku, 5,063,334, Cl. 318-568.100.

Kikkawa, Masanari: *See—*
Kanba, Masaru; Inoue, Yasuo; Mukai, Sadayoshi; Kikkawa, Masanari; and Suga, Yasunori, 5,062,292, Cl. 73-19.010.

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Murai, Hiroaki; Katano, Tatsuya; and Kikuchi, Shigeki, 5,063,398, Cl. 346-157.000.

Kikuda, Shigeru; Miyamoto, Hiroshi; and Yamada, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Delay circuit employing different threshold FET's. 5,063,313, Cl. 307-605.000.

Kilham, Peter, to Droll Yankees, Inc. Bird feeder. 5,062,388, Cl. 119-52.200.

Killilea, Timothy R.; and Sattler, David W. Apparatus for cleaning cutting table support surface. 5,062,334, Cl. 83-99.000.

Kim, Ki-Joon, to SamSung Electronics Co., Ltd. Method for making an LED array. 5,063,420, Cl. 357-17.000.

Kim, Tae I.: *See—*
Lee, Jae S.; Kim, Tae I.; and Kim, Young S., 5,063,584, Cl. 379-29.000.

Kim, Young J.: *See—*
Lee, Chang H.; and Kim, Young J., 5,062,164, Cl. 4-194.000.

Kim, Young S.: *See—*
Lee, Jae S.; Kim, Tae I.; and Kim, Young S., 5,063,584, Cl. 379-29.000.

Kimberly-Clark Corp.: *See—*
Conrad, Daniel J.; Davenport, Jerry W.; Isen, Robert R.; Bullock, Michael A.; and Riddell, Wilfred E., 5,062,716, Cl. 383-9.000.
Sasse, Philip A., 5,063,272, Cl. 524-377.000.

Kimmo, Selin, to Kone Elevator GmbH. Procedure and apparatus for transmitting binary messages in a serial communication bus. 5,063,561, Cl. 370-85.200.

Kimura, Makoto: *See—*
Kawata, Yutaka; Inoue, Ken-ichi; Ishibashi, Kiyotaka; Kobayashi, Akira; Inoue, Koji; Suzuki, Norio; Arai, Akio; Yamada, Kaneo; Tokushige, Keizo; Fukuyama, Hirofumi; Adachi, Shigeto; Furukawa, Yukito; Takahashi, Sunao; and Kimura, Makoto, 5,063,294, Cl. 250-309.000.

Kimura, Morio: *See—*
Wasimoto, Takasi; and Kimura, Morio, 5,062,818, Cl. 445-22.000.

Kindry, David A.: *See—*
Rye, Grover W.; Kindry, David A.; and Weber, Carolyn T., 5,062,462, Cl. 152-548.000.

Kinebuchi, Tatsuo: *See—*
Yamamoto, Haruhisa; Urata, Hidenobu; Kinebuchi, Tatsuo; and Sawabe, Hidenori, 5,062,982, Cl. 252-62.570.
Yamamoto, Haruhisa; Urata, Hidenobu; Kinebuchi, Tatsuo; and Sawabe, Hidenori, 5,062,983, Cl. 252-62.570.

Kinetic Concepts, Inc.: *See—*
Vrzalik, John H., 5,062,171, Cl. 5-455.000.

King, Patrick D., to Flo-Con Systems, Inc. Cantilever spring mount for sliding gate valve and method. 5,062,553, Cl. 222-590.000.

Kingett, Betty M.; Kingett, Donald L., executor; and Kingett, III, executor Albert E. Horse tail cover and method. 5,062,256, Cl. 54-78.000.

Kingett, Donald L., executor: *See—*
Kingett, Betty M.; Kingett, Donald L., executor; and Kingett, III, executor Albert E., 5,062,256, Cl. 54-78.000.

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Kinkade, Donald J., to Kinkade Family Partnership. Offset anatomical mouthpiece. 5,062,422, Cl. 128-207.140.

Kinkade Family Partnership: *See—*
Kinkade, Donald J., 5,062,422, Cl. 128-207.140.

Kinnear, Scott G.: *See—*
Dayan, Richard A.; Geisler, Douglas R.; Kinnear, Scott G.; Macon, James F., Jr.; and Schwartz, William H., 5,063,496, Cl. 395-700.000.

Kinoshita, Naoyoshi; and Kusumoto, Keiji, to Minolta Camera Kabushiki Kaisha. Image forming apparatus having a plurality of removable developing devices. 5,063,410, Cl. 355-204.000.

Kioritz Corporation: *See—*
Nagashima, Akira, 5,062,875, Cl. 55-493.000.

Kirker, Garry W.; Klocke, Donald J.; Vartuli, James C.; Chu, Pochen; Marler, David O.; and McWilliams, John P., to Mobil Oil Corp. Zeolite synthesis using an alcohol or like molecule. 5,063,038, Cl. 423-328.000.

Kishi, Masamichi: *See—*
Nakatani, Munehiro; Yamada, Hirokazu; and Kishi, Masamichi, 5,063,459, Cl. 358-404.000.

Kishida, Shigeru, to ODSK Company, Limited. Shank structure for annular hole cutter. 5,062,748, Cl. 408-206.000.

Kishimoto, Hitoshi, to Kabushiki Kaisha Toshiba. Orientation control apparatus for space vehicle. 5,062,592, Cl. 244-164.000.

Kishimoto, Juji, to Canon Kabushiki Kaisha. Electronic translator capable of producing a sentence by using an entered word as a key word. 5,063,534, Cl. 364-419.000.

Kishimoto, Junichi: *See—*
Hayashi, Minoru; Matsufuji, Mitoshi; Takahashi, Sakae; Kamiji, Koichi; Kobari, Kouichi; Kishimoto, Junichi; Shioda, Michio; and Kawaguchi, Masaaki, 5,062,367, Cl. 102-530.000.

Kisman, Kenneth E.; and Russell, Boyd, to Alberta Oil Sands Technology and Research Authority. Treatment for reducing water coning in an oil reservoir. 5,062,483, Cl. 166-263.000.

Kisner, Howard A. Holder for detachably mounting a receptable on a ladder. 5,062,607, Cl. 248-211.000.

Kissel, Klaus: *See—*
Astheimer, Hans; Brumme, Helma; Heck, Werner; Kissel, Klaus; and Schuy, Hubert, 5,063,464, Cl. 360-104.000.

Kita, Masahiro: *See—*
Honda, Ryoji; Kita, Masahiro; and Negoro, Ikuo, 5,063,416, Cl. 355-316.000.

Kitabayashi, Shinichi, to Blaupunkt Werke GmbH. Theft-protected vehicular accessory apparatus, particularly car radio and audio equipment. 5,063,611, Cl. 455-348.000.

Kitagawa, Katsuji; Moriguchi, Kazutomo; Miyake, Tetsuo; Sano, Katusya; Kittaka, Kiyoshi; and Sakakibara, Tetsuya, to Somar Corporation; and Nippondenso Co., Ltd. Expandable powder coating composition, method of coating a substrate with heat-insulating foam and composite material obtained thereby. 5,063,095, Cl. 428-35.800.

Kitagawa, Katsuji: *See—*
Kubo, Masao; Miyake, Tetsuo; Matsuzaki, Kunimitsu; and Kitagawa, Katsuji, 5,062,284, Cl. 72-46.000.

Kitagawa, Nobuhiro; and Gotsugi, Sigeru. Noosing bear trap. 5,062,237, Cl. 43-86.000.

Kitagawa, Yoshinori: *See—*
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 5,062,883, Cl. 71-94.000.

Kitahara, Satoshi: *See—*
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, 5,062,722, Cl. 400-120.000.

Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Pallet changer. 5,062,190, Cl. 29-33.00P.

Kitamura Machinery Co., Ltd.: *See—*
Kitamura, Koichiro, 5,062,190, Cl. 29-33.00P.

Kitayama, Ichiro: *See—*
Sawamura, Seishi; Nakajima, Sakuya; Amemori, Kunio; Oku, Hidehisa; Nakagawa, Akio; Kitayama, Ichiro; Matsuda, Hiromu; Yoshida, Katsuhiko; Takeda, Masaru; Nakane, Toshio; Horiguchi, Shiro; and Yuki, Shigeru, 5,062,856, Cl. 623-24.000.

Kittaka, Kiyoshi: *See—*
Kitagawa, Katsuji; Moriguchi, Kazutomo; Miyake, Tetsuo; Sano, Katusya; Kittaka, Kiyoshi; and Sakakibara, Tetsuya, 5,063,095, Cl. 428-35.800.

Kiyonari, Toshiyuki; Hirabayashi, Satoshi; Kidokoro, Naoto; and Takimoto, Futoshi, to Dainippon Ink and Chemicals, Inc. Laser-marking method and resin composition for laser-marking. 5,063,137, Cl. 430-292.000.

Klaus, Richard I.: *See—*
Tinder, Richard F.; and Klaus, Richard I., 5,063,536, Cl. 395-775.000.

Klein, Dennis H. Computer aided process for network analysis. 5,063,520, Cl. 364-512.000.

Klein, John: *See—*
Curreri, Victor; Klein, John; and Dubois, Janine, 5,063,518, Cl. 364-503.000.

Kleinhans, Josef, to Robert Bosch GmbH. Circuit arrangement with a flow probe operated in a bridge circuit. 5,063,352, Cl. 324-706.000.

Klemann, Lawrence P.; and Finley, John W., to Nabisco Brands, Inc. Processes for separation of sterol compounds from fluid mixtures using substantially insoluble compounds. 5,063,070, Cl. 426-271.000.

Klemann, Lawrence P.: *See—*
Yarger, Ronald G.; Klemann, Lawrence P.; and Finley, John W., 5,063,075, Cl. 426-601.000.

Kliklok Corporation: *See*—
Bacon, Forrest C.; and Hadden, William A., 5,062,253, Cl. 53-451.000.

Klimczak, William J., to Dustex Corporation. Method of retrofitting a dust collecting apparatus. 5,062,867, Cl. 55-96.000.

Klimenok, Alexandra P.: *See*—
Bakirov, Murat B.; Getman, Alexandr F.; Gribov, Boris I.; Bordjugovsky, Andrei A.; and Klimenok, Alexandra P., 5,062,293, Cl. 73-81.000.

Kline, John F.: *See*—
Lewis, Thomas E.; Williams, Richard A.; Gardiner, John P.; and Kline, John F., 5,062,364, Cl. 101-467.000.

Klocke, Donald J.: *See*—
Kirker, Garry W.; Klocke, Donald J.; Vartuli, James C.; Chu, Pochen; Marler, David O.; and McWilliams, John P., 5,063,038, Cl. 423-328.000.

Klockner, Albrecht. Zigzag breakwater. 5,062,739, Cl. 405-21.000.

Kloster, John M., to Atwood Industries, Inc. Air diffuser for a motor vehicle. 5,062,351, Cl. 98-2.090.

Klug, Alan G.: *See*—
Sarnosky, Joseph R.; Wolbrink, David W.; Klug, Alan G.; and Behm, Gary E., 5,062,410, Cl. 126-299.00D.

Knapp, Gene P., Sr.: *See*—
Vale, Christopher R.; Dominick, Thomas S.; Via, William R.; and Knapp, Gene P., Sr., 5,063,358, Cl. 331-60.000.

Knauer, Scott C.; Netravali, Arun N.; Petajan, Eric D.; Safranek, Robert J.; and Westerink, Peter H., to AT&T Bell Laboratories. High definition television arrangement with signal selections adapted to the available transmission capacity. 5,063,444, Cl. 358-133.000.

Knorr, Andreas: *See*—
Schwenner, Eckhard; Stegelmeier, Hartmut; Kazda, Stanislav; and Knorr, Andreas, 5,063,239, Cl. 514-357.000.

Knurr-Mechanik fur die Elektronik Aktiengesellschaft: *See*—
Paggen, Wolfgang; and Neblich, Josef, 5,063,477, Cl. 361-384.000.

Kobari, Kouichi: *See*—
Hayashi, Minoru; Matsufuji, Mitoshi; Takahashi, Sakae; Kamiji, Koichi; Kobari, Kouichi; Kishimoto, Junichi; Shioda, Michio; and Kawaguchi, Masaaki, 5,062,367, Cl. 102-530.000.

Kobayashi, Akira: *See*—
Kawata, Yutaka; Inoue, Ken-ichi; Ishibashi, Kiyotaka; Kobayashi, Akira; Inoue, Koji; Suzuki, Norio; Arai, Akio; Yamada, Kaneo; Tokushige, Keizo; Fukuyama, Hirofumi; Adachi, Shigeto; Furukawa, Yukito; Takahashi, Sunao; and Kimura, Makoto, 5,063,294, Cl. 250-309.000.

Kobayashi, Hiromi: *See*—
Miura, Haruo; Fukushima, Yasuo; Nishida, Hideo; Kobayashi, Hiromi; and Takagi, Takeo, 5,062,766, Cl. 415-199.100.

Kobayashi, Kazuo: *See*—
Gotoh, Hiroya; and Kobayashi, Kazuo, 5,062,348, Cl. 91-369.200.
Tsuyoshi, Hagio; Kobayashi, Kazuo; Yoshida, Hisayoshi; Ogawa, Ichitaro; Harada, Hiroshi; Yasunaga, Hiroaki; and Nishikawa, Hiroshi, 5,063,184, Cl. 501-96.000.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Shift control for small watercraft. 5,062,815, Cl. 440-41.000.

Kobayashi, Shigeo: *See*—
Takeshima, Akira; Asakura, Toshikazu; Takahashi, Akihiko; Kobayashi, Shigeo; and Hayashi, Shoichi, 5,062,491, Cl. 173-12.000.

Kober, Reiner: *See*—
Seele, Rainer; Brill, Gunter; Kober, Reiner; Saupe, Thomas; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,062,879, Cl. 71-92.000.

Koboshi, Shigeharu: *See*—
Kuse, Satoru; Ishikawa, Masao; Koboshi, Shigeharu; Ishikawa, Minoru; and Yagi, Toshihiko, 5,063,140, Cl. 430-393.000.

Kochloefl, Karl: *See*—
Burgfels, Gotz; Kochloefl, Karl; Ladebeck, Jurgen; Schmidt, Friedrich; Schneider, Michael; and Wernicke, Hans J., 5,063,187, Cl. 502-71.000.

Kocib, Vera M. Cover-up for infants. 5,062,168, Cl. 5-413.000.

Koehler, Dale R. Electrostatically actuatable light modulating device. 5,062,689, Cl. 359-230.000.

Koehlert, Kenneth C.: *See*—
Menashi, Jameel; and Koehlert, Kenneth C., 5,063,179, Cl. 501-12.000.

Koenig, Melissa M.; and Vukovich, William J., to General Motors Corporation. Control apparatus for regulating engagement of a fluid operated torque transmitting device. 5,062,321, Cl. 74-866.000.

Kohara, Teiji; Oshima, Masayoshi; and Natsuume, Tadao, to Nippon Zeon Co., Ltd. Optical disk. 5,063,096, Cl. 421-64.000.

Kohl, Gretchen S.; Giwa-Agbomeirele, Patricia A.; and Vincent, Judith M., to Dow Corning Corporation. Carboxy and carboxy-glycol ether and ester functional siloxane containing hair conditioners and shampoos. 5,063,044, Cl. 424-70.000.

Kohno, Hiroshi: *See*—
Sukekawa, Izumi; Asao, Haruhiko; Kohno, Hiroshi; Sugawara, Yukio; and Nogami, Keiji, 5,062,614, Cl. 266-216.000.

Kohno, Junichi: *See*—
Sugita, Shuichi; Mizukura, Noboru; Kohno, Junichi; Kadokura, Kenzi; and Tomotake, Atsushi, 5,063,148, Cl. 430-551.000.

Koizumi, Osamu: *See*—
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, 5,062,722, Cl. 400-120.000.

Kolesky, Eugene H. Construction square. 5,062,213, Cl. 33-479.000.

Komatsu, Fumiaki: *See*—
Miyao, Hidehiko; Ikeda, Satoshi; Shiotsuki, Masao; Kawamura, Shigeyoshi; Komatsu, Fumiaki; Takagi, Ikuji; and Sakai, Tadamiti, 5,063,001, Cl. 264-0.500.

Komoto, Teruo; Okawa, Junji; Ogawa, Yoichiro; Sato, Susumu; Taido, Naokata; and Kuraishi, Tadayuki, to SS Pharmaceutical Co., Ltd. Antiinflammatory dexamethasone 17α-cyclopropanecarboxylates with reduced systemic activity. 5,063,222, Cl. 514-180.000.

Komuro, Hirokazu, to Canon Kabushiki Kaisha. Process for preparing an ink jet head. 5,062,937, Cl. 204-192.150.

Kon, Richard H.: *See*—
Bobbowski, Louis G.; and Kon, Richard H., 5,062,181, Cl. 16-354.000.

Kondo, Hirokazu: *See*—
Toriuchi, Masaharu; and Kondo, Hirokazu, 5,063,135, Cl. 430-214.000.

Kondo, Isao: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

Kondo, Katsumi: *See*—
Ozawa, Sinya; Kondo, Katsumi; and Saito, Kajin, 5,062,886, Cl. 75-371.000.

Kondo, Kazuo: *See*—
Tsuge, Kazuto; Hattori, Masateru; Kondo, Kazuo; and Shibata, Yoshimasa, 5,062,798, Cl. 433-201.100.

Kondo, Shin-ichi; Katakura, Kageyoshi; and Ikeda, Hiroshi, to Hitachi Medical Corp. Beam forming method and apparatus therefor in ultrasonic imaging system. 5,063,541, Cl. 367-7.000.

Kondo, Toshihito: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 5,062,883, Cl. 71-94.000.

Kondo, Tsuneshi: *See*—
Nagakura, Hodaka; and Kondo, Tsuneshi, 5,062,399, Cl. 123-198.00D.

Kondoh, Koichi: *See*—
Fukada, Hirotaka; Kondoh, Koichi; and Tsuchida, Tsuyoshi, 5,062,496, Cl. 180-291.000.

Kone Elevator GmbH: *See*—
Kimmo, Selin, 5,063,561, Cl. 370-85.200.

Konica Corporation: *See*—
Haneda, Satoshi; Fukuchi, Masakazu; Matsuo, Shunji; and Morita, Shizuo, 5,063,411, Cl. 355-212.000.
Kuse, Satoru; Ishikawa, Masao; Koboshi, Shigeharu; Ishikawa, Minoru; and Yagi, Toshihiko, 5,063,140, Cl. 430-393.000.
Sugita, Shuichi; Mizukura, Noboru; Kohno, Junichi; Kadokura, Kenzi; and Tomotake, Atsushi, 5,063,148, Cl. 430-551.000.

Konig, Charles E., to United States of America, Army. Non-dispersive acoustic transport time delay beam steering antenna. 5,063,390, Cl. 342-375.000.

Konno, Mitsuo; Noro, Hisashi; and Katsura, Naotero, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for supplying electric power to resistance welding gun. 5,063,278, Cl. 219-86.100.

Konrad, Rainer: *See*—
Bauer, Peter; Konrad, Rainer; Morgenstern, Herbert; and Schuch, Horst, 5,063,016, Cl. 264-211.210.

Kopin Corporation: *See*—
Narayan, Jagdish, 5,063,202, Cl. 505-1.000.

Korabiak, Walter. Tremor-responsive shut-off valve. 5,062,440, Cl. 137-38.000.

Korea Telecommunications Authority: *See*—
Lee, Jae S.; Kim, Tae I.; and Kim, Young S., 5,063,584, Cl. 379-29.000.

Koshiishi, Takaho, to Ricoh Company, Ltd. Acoustic coupler and data transmission apparatus using the same. 5,063,590, Cl. 379-99.000.

Kosinski, Leonard E. R.: *See*—
Hayes, Richard A.; Kosinski, Leonard E. R.; and Wagman, Mark E., 5,063,263, Cl. 524-101.000.

Kosuga, Y.: *See*—
Takano, T.; Kosuga, Y.; and Sinzawa, K., 5,063,277, Cl. 200-531.000.

Kotobuki & Co., Ltd.: *See*—
Kageyama, Shubei; Kageyama, Toshihiko; Nakazato, Youichi; and Mitsuya, Yoshihide, 5,062,727, Cl. 401-52.000.

Koudsi, Antoine J.: *See*—
Al-Sioufi, Habib; and Koudsi, Antoine J., 5,062,837, Cl. 604-240.000.

Koumura, Noboru: *See*—
Yanagisawa, Ryozo; Tanioka, Hiroshi; Kaneko, Kiyoshi; Harada, Toshiaki; Yoshikawa, Kikuo; Koumura, Noboru; and Inui, Toshiharu, 5,063,451, Cl. 346-143.000.

Kox, Franciscus A. J. M., to U.S. Philips Corporation. Loading mechanism including a linkage mechanism, and recording and/or reproducing apparatus comprising such a loading mechanism. 5,063,463, Cl. 360-96.500.

Kozuki, Susumu: *See*—
Ishikawa, Hisashi; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, 5,063,457, Cl. 358-330.000.

Kraft General Foods, Inc.: *See*—
Kratochvil, John F., 5,063,073, Cl. 426-573.000.

Krallmann, Reinhold: *See*—
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 5,062,861, Cl. 8-639.000.

Kramer, David E.; Muetterties, Andrew J.; and Szempruch, Walter T., to Abbott Laboratories. Solution pumping system including disposable pump cassette. 5,062,774, Cl. 417-413.000.

Krasser, Fritz: *See*—
Onderka, Oswald; and Krasser, Fritz, 5,062,668, Cl. 292-25.000.

Kratochvil, John F., to Kraft General Foods, Inc. C-Gel composite food products. 5,063,073, Cl. 426-573.000.

Krauss-Maffei A.G.: *See*—
Schneider, Fritz W., 5,063,027, Cl. 422-133.000.

Krehl, Michael E., to CTB, Inc. Feed car apparatus. 5,062,389, Cl. 119-57.600.

Krenecki, Tom. Overflow control apparatus for water closets. 5,062,166, Cl. 4-427.000.

Kress, Glenn F.; and Coy, Gerald L., to Xerox Corporation. Double feeding prevention in a bottom sheet document feeder. 5,062,602, Cl. 271-104.000.

Kriegel, Jon M.; and Albrecht, Richard E., to Eastman Kodak Company. Sheet separating mechanism and apparatus for use therein. 5,062,599, Cl. 271-35.000.

Kroker, Joerg; and Vargiu, Silvio, to BASF Aktiengesellschaft. Size for carbon fibers and glass fibers. 5,063,261, Cl. 523-402.000.

Kroll, Peter, to Gebhard Balluff Fabrik feinmechanischer Erzeugnisse GmbH & Co. Plug insert for a metal tube housing. 5,062,810, Cl. 439-589.000.

Kruer, Mark A., to United States of America, National Aeronautics and Space Administration. Wide acceptance angle, high concentration ratio, optical collector. 5,062,899, Cl. 136-259.000.

Kruger, Christof; and Cappelmann, Karl, to Suomen Xyrofin Oy. Sugar-free crust chocolates. 5,063,080, Cl. 426-660.000.

Krupp Koppers GmbH: *See*—
Durselen, Heinz; Schuffler, Arnulf; and Meyer, Gunter, 5,062,925, Cl. 201-41.000.

Krupp Polysius AG: *See*—
Schaberg, Frank; Martens, Heribert; and Pohlmann, Peter, 5,062,615, Cl. 266-217.000.

Kubisch, John G.; Mercer, James B.; Schaeff, Wilmer G.; and Wenzel, Thomas E., to General Motors Corporation. Countergravity casting apparatus and method. 5,062,466, Cl. 164-7.100.

Kubisch, John G.; and Wilczynski, Paul D., to General Motors Corporation. Vacuum countergravity casting apparatus and method. 5,062,467, Cl. 164-7.100.

Kubo, Kazuhiro: *See*—
Nomoto, Yuji; Takai, Haruki; Ohno, Tetsuji; and Kubo, Kazuhiro, 5,063,227, Cl. 514-252.000.

Kubo, Masao; Miyake, Tetsuo; Matsuzaki, Kunimitsu; and Kitagawa, Katsuji, to Somar Corporation. Method of fabricating a bent metal body with hardenable resin coating. 5,062,284, Cl. 72-46.000.

Kubo, Tsutomu; Terao, Kazuo; Yamamuro, Takashi; Kajimoto, Masashi; and Tsukagoshi, Kazuhiko, to Fuji Xerox Co., Ltd. Electrophotographic developing system comprising toner having specific particle size distribution. 5,063,133, Cl. 430-122.000.

Kubota, Keiichi: *See*—
Kawai, Shigeru; and Kubota, Keiichi, 5,063,531, Cl. 395-25.000.

Kubota LTD: *See*—
Samejima, Kazuo; and Kawakita, Hiroaki, 5,062,258, Cl. 56-202.000.

Kuehn, Christa G.; Rossi, Debra J.; and Isied, Stephan S., to Biometallics, Inc. Immunoassay method and kit. 5,063,151, Cl. 435-7.330.

Kuehnle, Manfred R. Optoelectronic signal recording medium and method of making same. 5,063,538, Cl. 365-106.000.

Kuemmel, Theodore J.: *See*—
James, Paul; Kuemmel, Theodore J.; Wurm, Michael G.; Banach, James D.; and Fulton, David, 5,062,432, Cl. 128-736.000.

Kuenast, Christoph: *See*—
Leyendecker, Joachim; Kuenast, Christoph; and Hofmeister, Peter, 5,063,232, Cl. 514-247.000.

Kuhara, Shigehide; and Satoh, Kozo, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging system. 5,063,348, Cl. 324-307.000.

Kulkarni, Prakash K.: *See*—
Headley, Philip M.; and Kulkarni, Prakash K., 5,063,514, Cl. 364-426.020.

Kumada, Hiroyoshi: *See*—
Edahiro, Takeshi; Takehara, Shin; Morita, Toshiki; and Kumada, Hiroyoshi, 5,062,659, Cl. 280-707.000.

Kumada, Junji: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

Kumagai, Takenori, to Shimizu Construction Co., Ltd. Openable roof. 5,062,243, Cl. 52-66.000.

Kumagai, Tatsuya: *See*—
Tomita, Yukio; Yamaba, Ryota; and Kumagai, Tatsuya, 5,062,905, Cl. 148-111.000.

Kummer, Frederick J., to Hospital for Joint Diseases. Protector pad. 5,062,433, Cl. 128-888.000.

Kunert, Heinz, to Saint-Gobain Vitrage. Glass pane intended direct bonding, especially automobile glass pane. 5,062,248, Cl. 52-208.000.

Kunst, Neil W.; Fraser, James D.; and Amaro, Josephina, to Clean Air Technologies Inc. Automotive engine signal digitization. 5,063,515, Cl. 364-431.010.

Kuo, Elizabeth A.: *See*—
Fenske, Dankwart C.; Kuo, Elizabeth A.; and Tully, Wilfred R., 5,063,229, Cl. 514-258.000.

Kuo, Mei-Hui: *See*—
Chang, Ming-Ju; Hsu, Yuan-Hsun; Kuo, Mei-Hui; and Soong, Tai-Sen, 5,063,244, Cl. 514-456.000.

Kuo, Youti. Dentifrice dispensing toothbrush with replaceable cartridge. 5,062,728, Cl. 401-176.000.

Kupcikevicius, Vytautas, to Viskase Corporation. Vacuum packaging method and apparatus. 5,062,252, Cl. 53-434.000.

Kupper, Hanspeter: *See*—
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Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, to Nihon Tokushu Noyaku Seizo K.K. Spiro-benzyl-3-substituted pyridines. 5,062,883, Cl. 71-94.000.

Kuraishi, Tadayuki: *See*—
Komoto, Teruo; Okawa, Junji; Ogawa, Yoichiro; Sato, Susumu; Taido, Naokata; and Kuraishi, Tadayuki, 5,063,222, Cl. 514-180.000.

Kurakake, Mitsuo; Otsuka, Shoichi; and Muraoka, Yutaka, to Fanuc Ltd. Picture processing apparatus including data conversion table for performing convolutional processing. 5,063,525, Cl. 395-157.000.

Kuramoto, Nobuyuki: *See*—
Taniguchi, Hitofumi; and Kuramoto, Nobuyuki, 5,063,183, Cl. 501-96.000.

Kurihashi, Kazunari: *See*—
Takamura, Toshiyuki; Kurihashi, Kazunari; and Harada, Masazumi, 5,062,545, Cl. 221-152.000.

Kurita, Taiichiro: *See*—
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Kuriyama, Fumio: *See*—
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 5,062,271, Cl. 62-55.500.

Kuroda, Yasuo: *See*—
Nakagawa, Katsumi; Kawai, Tatsundo; and Kuroda, Yasuo, 5,063,462, Cl. 358-475.000.

Kuroiwa, Katsumasa: *See*—
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Kuroyanagi, Akira: *See*—
Fujii, Tetsuo; Sakai, Minekazu; and Kuroyanagi, Akira, 5,063,423, Cl. 357-23.500.

Kusaka, Tadao: *See*—
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, 5,062,771, Cl. 417-201.000.

Kusakai, Shigenobu: *See*—
Akahane, Shoji; Tosaki, Satoshi; Kusayanagi, Yukiharu; Kusakai, Shigenobu; Hirota, Kazuo; and Tomioka, Kentaro, 5,063,257, Cl. 523-116.000.

Kusayanagi, Yukiharu: *See*—
Akahane, Shoji; Tosaki, Satoshi; Kusayanagi, Yukiharu; Kusakai, Shigenobu; Hirota, Kazuo; and Tomioka, Kentaro, 5,063,257, Cl. 523-116.000.

Kuse, Satoru; Ishikawa, Masao; Koboshi, Shigeharu; Ishikawa, Minoru; and Yagi, Toshihiko, to Konica Corporation. Method for processing silver halide color photographic light-sensitive materials. 5,063,140, Cl. 430-393.000.

Kuslich, Stephen D.; and Corin, James D., to Spine-Tech, Inc. Method of making an intervertebral reamer. 5,062,845, Cl. 606-80.000.

Kusumoto, Keiji: *See*—
Kinoshita, Naoyoshi; and Kusumoto, Keiji, 5,063,410, Cl. 355-204.000.

Kwack, Eug Y.: *See*—
Shakkottai, Parthasarathy; and Kwack, Eug Y., 5,062,295, Cl. 73-290.00V.

Kwasniewicz, Ronald W.: *See*—
Braun, Paul; and Kwasniewicz, Ronald W., 5,063,406, Cl. 355-57.000.

Kwaun Manufacturing Company: *See*—
Braun, Paul; and Kwasniewicz, Ronald W., 5,063,406, Cl. 355-57.000.

Kwon, Oh-Seol, to SamSung Electronics Co., Ltd. Tone-type recognition method. 5,063,593, Cl. 379-386.000.

Kyle, Albert S., III: *See*—
Lindsey, James D.; Hutton, Charles D.; Tubb, Joe W.; Shipman, Carol L.; and Kyle, Albert S., III, 5,063,507, Cl. 364-408.000.

Kyle, Donald J.: *See*—
Abreu, Mary E.; Rzeszotarski, Waclaw; Kyle, Donald J.; Hiner, Roger N.; and Elliott, Richard L., 5,063,245, Cl. 514-404.000.

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Nomoto, Yuji; Takai, Haruki; Ohno, Tetsuji; and Kubo, Kazuhiro, 5,063,227, Cl. 514-252.000.

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Dwivedi, Ratnesh K.; and Kennedy, Christopher R., 5,063,185, Cl. 501-126.000.

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Leedy, K. Duane; and Peiffer, Norman A., to Andersons, The. Cellulose absorbent product and method of manufacture. 5,062,954, Cl. 210-502.100.

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Legge, Richard C.; and Arp, George F., to John D. Brush & Co., Inc. Draped parison blow molded box. 5,063,094, Cl. 428-35.700.

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Kennedy, Earl W.; Oexman, Robert D.; and Higgins, Larry, 5,062,169, Cl. 5-449.000.
Stewart, Ralph D., 5,062,172, Cl. 5-474.000.

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Peterson, William M.; Hume, Christopher N.; and Leivian, Robert H., 5,063,521, Cl. 395-27.000.

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Lennox Industries Inc.: *See—*
Loberger, Gregory C.; and Slind, Jay L., 5,062,790, Cl. 431-114.000.

Lenti, Daria; and Visca, Mario, to Ausimont S.r.L. Use of perfluoropolyethers in the form of an aqueous microemulsion for protecting stony materials from atmospheric agents. 5,063,092, Cl. 427-393.000.

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Barbu, Stephane; and Le Pailleur, Laurent, 5,063,312, Cl. 307-603.000.

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Lettenbauer, Gustav: *See—*
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Davis, Ray E.; Duncan, Dana L.; Habboosh, Samir W.; Hall, James R.; Nudelman, Dennis L.; and Westkamper, Michael J., 5,062,299, Cl. 73-609.000.
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Drouet, Ludovic O.; Bal Dit Sollier, Claire; Mazoyer, Elisobeth M.; Levy Toledano, Sylviane; Jolles, Pierre; and Fiat, Ann-Taiic D., 5,063,203, Cl. 514-8.000.

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Leyendecker, Joachim; Kuenast, Christoph; and Hofmeister, Peter, to BASF Aktiengesellschaft. 2-tert-butyl-4-chloro-5-(4-tert-butylbenzylthio)-3(2H)-pyridazinone for cotrolling snails and slugs. 5,063,232, Cl. 514-247.000.

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Liang, Dong C.; and Blades, Michael W., to University of British Columbia. Capacitively coupled plasma detector for gas chromatography. 5,062,708, Cl. 356-316.000.

Libbert, Dan: *See—*
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Liebel, Henry L., to Shippers Paper Products Company. Economy void filler. 5,062,751, Cl. 410-154.000.

Liebs, Harald: *See—*
Carduck, Franz-Josef; Wuest, Willi; Harth, Hubert; and Liebs, Harald, 5,062,997, Cl. 260-400.000.

Lien, Sheue-Ling; Shantz, Michael J.; Carrie, Susan E.; Loo, Jim V.; and Elrod, David, to Sun Microsystems, Inc. Method and apparatus for shading images. 5,063,375, Cl. 340-703.000.

Lighthouse Manufacturing Co., Inc.: *See—*
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Lim, Joon Young: *See—*
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Limburg, William W.: *See—*
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Lin, Cheng-I: *See—*
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Lind, Robert J.: *See—*
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Linden-Smith, Neil A.; and Rowley, Andrew T., to Thorn Emi plc. Discharge tube arrangement. 5,063,333, Cl. 315-326.000.

Lindert, Andreas; Pierce, John R.; and McCormick, David R., to Henkel Corporation. Hydroxylamine or amine oxide containing polyphenolic compounds and uses thereof. 5,063,089, Cl. 427-354.000.

Lindner, Josef: *See—*
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Lindsey, James D.; Hutton, Charles D.; Tubb, Joe W.; Shipman, Carol L.; and Kyle, Albert S., III, to Plains Cotton Cooperative Association. Goods database employing electronic title or documentary-type title. 5,063,507, Cl. 364-408.000.

Lindsey, John J.: *See—*
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Lindsley, George R. Fishing rod holder with fish alert. 5,063,373, Cl. 340-573.000.

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Linke, Scott L., to Delco Electronics Corporation. Mode selectable interface circuit for an air core gage controller. 5,063,344, Cl. 324-115.000.

Liou, Charg-Shing. Gas blowtorch. 5,062,791, Cl. 431-266.000.

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Lipscombe, Brian R., to Ultra Hydraulics Limited. Rotary drive mechanisms. 5,062,259, Cl. 56-255.000.

Lipton, Lenny; and Meyers, Lawrence D., to StereoGraphics Corporation. Stereoscopic video cameras with image sensors having variable effective position. 5,063,441, Cl. 358-88.000.

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Herman, Frederick L.; Savoca, Ann C. L.; and Listemann, Mark L., 5,062,998, Cl. 260-665.00R.

Liu, Ruichen: *See—*
Hillenius, Steven J.; Lebowitz, Joseph; Liu, Ruichen; and Lynch, William T., 5,063,422, Cl. 357-23.300.

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Hargis, I. Glen; Fabris, Hubert J.; Wilson, John A.; and Livigni, Russell A., 5,063,190, Cl. 502-157.000.

Livny, Ishak M.: *See—*
Hekker, Roeland M.T.; and Livny, Ishak M., 5,063,442, Cl. 358-93.000.

Lloyd, Daniel L.; and Cooke, Eugene L., to Cold Jet, Inc. Method for deflashing articles. 5,063,015, Cl. 264-161.000.

Loberger, Gregory C.; and Slind, Jay L., to Lennox Industries Inc. Burner sound reduction enclosure. 5,062,790, Cl. 431-114.000.

Lochmiller, Alan W. Small terrace generating machine with lateral dammers. 5,062,488, Cl. 172-1.000.

Loctite Corporation: *See—*
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Long, Alden O., Jr., to AMP Incorporated. Insertion/extraction tool for substrate package. 5,062,201, Cl. 29-741.000.

Longo, Robert T.; Bardai, Zaher; Manoly, Arthur E.; Forman, Ralph; and Rolph, Randy K., to Hughes Aircraft Company. Field emitter structure providing passageways for venting of outgassed materials from active electronic area. 5,063,323, Cl. 313-309.000.

Loo, Jim V.: *See—*
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Lorence, Brian S.: *See—*
Phelps, Richard A.; and Lorence, Brian S., 5,062,608, Cl. 248-289.100.

Lorimer, D'Arcy, to Applied Materials, Inc. Steam generator. 5,063,609, Cl. 392-401.000.

Lorraine Distribution Buzy-Vigneau: *See—*
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Lu, Juinn-Horng: *See—*
Liu, Yun-Yu; and Lu, Juinn-Horng, 5,062,813, Cl. 439-857.000.

Lubrizol Corporation, The: *See—*
Bayles, Frederick L., Jr.; Walsh, Reed H.; and Tipton, Craig D., 5,062,975, Cl. 252-33.000.

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Lucas, John T.: *See—*
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Luciano Bonansea: *See—*
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Luetkemeyer, Kent: *See—*
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Luker, Norman E., to Exxon Chemical Patents Inc. Method for producing an elastomeric crumb using gas to first cut an extruded hot, sticky elastomeric extrudate material, form the crumb, and then convey it away. 5,063,002, Cl. 264-12.000.

Lunzer, Lawrence J.: *See—*
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Luo, Guo Chun: *See—*
Jin, JiQuan; Di Shang, Lian; Jin, Guo Quan; Xu, Yong; and Luo, Guo Chun, 5,063,195, Cl. 502-341.000.

Lupton, F. Stephen; DeFilippi, Louis J.; and Goodman, James R., to Allied-Signal Inc. Bioremediation of chromium (VI) contaminated aqueous systems by sulfate reducing bacteria. 5,062,956, Cl. 210-611.000.

Lutz, Michael A.: *See—*
Lee, Chi-Long; Lutz, Michael A.; and VanWert, Bernard, 5,063,102, Cl. 428-209.000.

Lykken, Thomas G.; and Kemper, Philip T., to J. I. Case Company. Handle position control apparatus. 5,062,316, Cl. 74-529.000.

Lynch, William T.: *See—*
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Lyons, Peter R. A.: *See—*
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M-B-W Inc.: *See—*
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MacDonald, Scott A.: *See—*
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Machui, Jurgen: *See—*
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Mack, William J.; and Markyvech, Ronald K., to Eaton Corporation. Enhanced missed shift recovery for semi-automatic shift implementation control system. 5,063,511, Cl. 364-424.100.

Mackal, Glenn H. Snap rivet safety lock for inflators. 5,062,546, Cl. 222-3.000.

Mackey, Donald A., to PPG Industries, Inc. Zero diameter locator post. 5,062,621, Cl. 269-305.000.

MacMillan Bloedel Limited: *See*—
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MacMillan, Donald M. Lockable/unlockable pivoted connection apparatus. 5,062,731, Cl. 403-96.000.

MacMillan, Michael; and Haid, Regis, Jr., to University of Florida. Axially-fixed vertebral body prosthesis and method of fixation. 5,062,850, Cl. 623-17.000.

Macon, James F., Jr.: *See*—
Dayan, Richard A.; Geisler, Douglas R.; Kinnear, Scott G.; Macon, James F., Jr.; and Schwartz, William H., 5,063,496, Cl. 395-700.000.

MacPhail, Margaret G., to International Business Machines Corporation. Method of associating document processing states with an action market. 5,063,495, Cl. 395-650.000.

Maeda Industries, Ltd.: *See*—
Yamazaki, Toshimasa, 5,062,318, Cl. 74-594.200.

Maeda, Takeshi; Kawaguchi, Hiroshi; Yamaguchi, Harukazu; Sakai, Hitoshi; Ando, Akio; Matsushita, Yasuo; and Takemoto, Tetsuya, to Osaka Gas Limited; and Asahi Seisakusho Company Limited. Solvent recovery apparatus. 5,062,926, Cl. 202-183.000.

Maehara, Minoru; and Nagase, Haruo, to Matsushita Electric Works Ltd. Regulated chopper and inverter with shared switches. 5,063,490, Cl. 363-37.000.

Maekawa, Takashi: *See*—
Inomata, Mitsugu; Nakao, Fumio; Maekawa, Takashi; Uchiyama, Kaneastu; Endo, Tetsu; Nobue, Kazuo; Shimazaki, Masaki; and Idouji, Shigeki, 5,062,726, Cl. 400-630.000.

Maekawa, Yukio: *See*—
Yoneyama, Masakazu; Yamada, Ryosuke; Nishiura, Yosuke; Maekawa, Yukio; Higaki, Yuzo; and Iwamoto, Yoshiaki, 5,063,147, Cl. 430-523.000.

Magee, Charles. Hand table and carrying rack. 5,062,674, Cl. 294-143.000.

Magengast, William E.: *See*—
McMahan, David R.; Magengast, William E.; and Mateos, Luis A., 5,063,480, Cl. 362-61.000.

Maghon, Helmut, to Siemens Aktiengesellschaft. Hybrid burner for a pre-mixing operation with gas and/or oil, in particular for gas turbine systems. 5,062,792, Cl. 431-284.000.

Magnussen, Haakon T., Jr., to Rainin Instrument Co., Inc. High pressure fluid sample flow cell with circumferential window edge seal. 5,062,706, Cl. 356-246.000.

Mahony, Thomas H., III. Interference fixation screw with integral instrumentation. 5,062,843, Cl. 606-53.000.

Mahvi, A. Pascal; and Mahvi, Caryl. Infant care bag. 5,062,557, Cl. 224-153.000.

Mahvi, Caryl: *See*—
Mahvi, A. Pascal; and Mahvi, Caryl, 5,062,557, Cl. 224-153.000.

Maier, Ulrich; and Raff, Friedrich, to Dr. Ing. h.c.F. Porsche AG. Shifting arrangement for a motor vehicle transmission. 5,062,314, Cl. 74-475.000.

Maier, Willy, to Daverio AG. Stacker, especially for an offset plate transporter. 5,062,763, Cl. 414-787.000.

Maitz, Carlos A.; and Hauser, George M. Aspirator device for body fluids. 5,062,835, Cl. 604-153.000.

MAJCO Building Specialties, L.P.: *See*—
Karabin, Tadeusz; and Mundy, Roy E., 5,062,411, Cl. 126-523.000.

Majeed, Kamal N., to General Motors Corporation. On/off semi-active suspension control. 5,062,657, Cl. 280-707.000.

Majeed, Kamal N., to General Motors Corporation. Vehicle suspension control with real time gain switching. 5,062,658, Cl. 280-707.000.

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Major, Matthew M.: *See*—
Dyer, John; Mathews, Grace; and Major, Matthew M., 5,062,418, Cl. 128-156.000.

Makielski, James A. Boat anchor line control. 5,062,375, Cl. 114-210.000.

Makimura, Toshiro, to Aisan Kogyo Kabushiki Kaisha. Nozzle structure in electromagnetic fuel injector. 5,062,573, Cl. 239-533.120.

Malcolm, Roger J.: *See*—
Frazee, John G.; and Malcolm, Roger J., 5,062,848, Cl. 606-213.000.

Mallon, Joseph R., Jr.: *See*—
Petersen, Kurt E.; Barth, Philip W.; Bryzek, Janusz; and Mallon, Joseph R., Jr., 5,062,302, Cl. 73-754.000.

Mallory, Mitchell K. Toy vehicle apparatus. 5,062,819, Cl. 446-462.000.

Malpass, Dennis B.; and Wang, Bor-Ping E., to Texas Alkyls, Inc. Catalyst component for ethylene polyermization and copolymerization. 5,063,188, Cl. 502-116.000.

Mammino, Joseph: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Yanus, John F.; Limburg, William W.; and Mammino, Joseph, 5,063,125, Cl. 430-59.000.
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Mammino, Joseph; Yu, Robert C. U.; Hamilton, Vincent E.; Limburg, William W.; and Chen, Cindy, 5,063,128, Cl. 430-63.000.

Man Roland Druckmaschinen AG: *See*—
Reichel, Klaus T., 5,062,363, Cl. 101-415.100.

Manley, Martin H., to National Semiconductor Corporation. Manufacture of a split-gate EPROM cell using polysilicon spacers. 5,063,172, Cl. 437-43.000.

Manoly, Arthur E.: *See*—
Longo, Robert T.; Bardai, Zaher; Manoly, Arthur E.; Forman, Ralph; and Rolph, Randy K., 5,063,323, Cl. 313-309.000.

Mantovani, Marco; and Rossetto, Giorgio. Device for locking a blood centrifugation cell on a chuck. 5,062,826, Cl. 494-85.000.

Marathon Oil Company: *See*—
Schroeder, Donald E., Jr.; and Falk, David O., 5,062,484, Cl. 166-278.000.

Marazzi, Silvio, to Diamond S.A. Connector for an optical fiber. 5,062,682, Cl. 385-85.000.

Marchiony, Larry: *See*—
Neustat, Paula; and Marchiony, Larry, 5,062,534, Cl. 211-48.000.

Marcinkowski, John; Bennett, Herbert W.; and Niwa, Kenji, to DeVilbiss (Canada) Limited. Method and apparatus for removing sludge from a spray booth. 5,062,963, Cl. 210-712.000.

Marco Seattle, Inc: *See*—
Cook, Harold T., Jr.; and Fielding, Mimi S., 5,062,235, Cl. 43-42.000.

Marcuse, Dietrich, to AT&T Bell Laboratories. Optimized wavelength-division-multiplexed lightwave communication system. 5,063,559, Cl. 359-127.000.

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Grois, Igor; and Margolin, Mark, 5,062,683, Cl. 385-87.000.

Maric, Radovan R., to Union Carbide Canada Limited. Automatic changeover manifold. 5,062,443, Cl. 137-113.000.

Marjancik, John R.: *See*—
Hall, David A.; and Marjancik, John R., 5,062,720, Cl. 384-484.000.

Markunas, Albert L., to Sundstrand Corporation. Hydromechanical control of differential pressure across a variable displacement hydraulic motor. 5,062,265, Cl. 60-450.000.

Markyvech, Ronald K.: *See*—
Mack, William J.; and Markyvech, Ronald K., 5,063,511, Cl. 364-424.100.

Marler, David O.: *See*—
Kirker, Garry W.; Klocke, Donald J.; Vartuli, James C.; Chu, Pochen; Marler, David O.; and McWilliams, John P., 5,063,038, Cl. 423-328.000.

Marley Company, The: *See*—
Goins, James V.; Duggan, Robert B.; Pier, William J.; and Wienhoft, Roger, 5,062,354, Cl. 98-62.000.

Marpinard, Jean-Claude: *See*—
Capel, Antoine; and Marpinard, Jean-Claude, 5,063,338, Cl. 318-685.000.

Marr, Helen E.: *See*—
Sanger, Gareth J.; and Marr, Helen E., 5,063,231, Cl. 514-214.000.

Marriage, Peter V., to Rolls-Royce plc. Cooled turbomachinery components. 5,062,768, Cl. 416-97.00R.

Mars, Suzanne P. Adjustable chair. 5,062,676, Cl. 297-338.000.

MarShel Corporation: *See*—
Burns, Marsha L., 5,062,272, Cl. 62-78.000.

Martens, Heribert: *See*—
Schaberg, Frank; Martens, Heribert; and Pohlmann, Peter, 5,062,615, Cl. 266-217.000.

Martin Archery, Inc.: *See*—
Newbold, George T., 5,062,407, Cl. 124-44.500.

Martin, John P., to Eaton Corporation. Pivot assembly for vehicle headlight position adjustment. 5,063,481, Cl. 362-61.000.

Martin, Lendell, Sr. Air conditioning apparatus. 5,062,280, Cl. 62-291.000.

Martin, Luther W.; and Smith, Richard L. Method of making live gas main insertions. 5,062,207, Cl. 29-890.140.

Martin Marietta Corporation: *See*—
Lipps, Gary D.; and Wood, Stephen D., 5,062,583, Cl. 244-3.150.

Martin, Martial G. E.; and Nuttin, Pierre L. V., to Syntone. Method of forming a new pile after discharge of a completed pile in a pile-forming machine associated in particular with a printer and device for carrying out this method. 5,062,597, Cl. 270-39.000.

Martone, Christopher J., to General Motors Corporation. Flexible link and method for a vehicular suspension system. 5,062,620, Cl. 267-260.000.

Martorano, Richard, to Rohm and Haas Company. Method for use of aqueous elastomeric coatings. 5,063,091, Cl. 427-385.500.

Marubeni Kabushikigaisha: *See*—
Kawashima, Ichiro; Seki, Mitsuo; and Hirano, Isao, 5,062,279, Cl. 62-235.000.

Marui, Masatoshi; Inage, Tomonori; Matsui, Yuji; and Ishizuka, Tazuko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure apparatus. 5,062,692, Cl. 359-45.000.

Masco Industries, Inc.: *See*—
DeLand, Daniel L., 5,062,241, Cl. 49-460.000.

Mase, Masahiro: *See*—
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, 5,062,771, Cl. 417-201.000.

Mason, John G.; Miller, John W.; Sauerwein, William D.; and Vick, Stephen L., to Black & Decker, Inc. Universal motor with secondary winding wound with the run field winding. 5,063,319, Cl. 310-210.000.

Mason, Robert F. Dental flossing tool. 5,062,437, Cl. 132-323.000.

Masterson, Don: *See*—
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, 5,062,288, Cl. 72-383.000.

Masuda, Michio: *See*—
Owashi, Hitoaki; Ohtsubo, Hiroyasu; Sekiya, Masataka; Minabe, Kohji; Nishijima, Hideo; Masuda, Michio; and Rokuda, Morito, 5,063,437, Cl. 358-22.000.

MASX Energy Services Group, Inc.: *See*—
Bailey, Thomas F.; and Campbell, John E., 5,062,450, Cl. 137-533.210.
Bailey, Thomas F.; and Moeller, Larry F., 5,062,479, Cl. 166-84.000.

Mateos, Luis A.: *See*—
McMahan, David R.; Magengast, William E.; and Mateos, Luis A., 5,063,480, Cl. 362-61.000.

Mathews, Grace: *See*—
Dyer, John; Mathews, Grace; and Major, Matthew M., 5,062,418, Cl. 128-156.000.

Matson, Charles J.; and Velasquez, David J., to Minnesota Mining and Manufacturing Company. Equine aerosol drug delivery method and apparatus. 5,062,423, Cl. 128-207.150.

Matsuda, Hiromu: *See*—
Imai, Akihiro; Kawakami, Tetsuji; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, 5,063,198, Cl. 503-227.000.
Sawamura, Seishi; Nakajima, Sakuya; Amemori, Kunio; Oku, Hidehisa; Nakagawa, Akio; Kitayama, Ichiro; Matsuda, Hiromu; Yoshida, Katsuhiko; Takeda, Masaru; Nakane, Toshio; Horiguchi, Shiro; and Yuki, Shigeru, 5,062,856, Cl. 623-24.000.

Matsuda, Takumi, to Seikosha Co., Ltd. Feeder. 5,062,382, Cl. 119-51.040.

Matsufuji, Mitoshi: *See*—
Hayashi, Minoru; Matsufuji, Mitoshi; Takahashi, Sakae; Kamiji, Koichi; Kobari, Kouichi; Kishimoto, Junichi; Shioda, Michio; and Kawaguchi, Masaaki, 5,062,367, Cl. 102-530.000.

Matsui, Hideki: *See*—
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Iida, Yoshikazu; Sakamoto, Hiroshi; and Matsui, Hideki, 5,063,403, Cl. 354-413.000.

Matsui, Yoshikazu: *See*—
Shiokawa, Shoko; Matsui, Yoshikazu; and Ueda, Toshihiko, 5,063,396, Cl. 346-140.00R.

Matsui, Yuji: *See*—
Marui, Masatoshi; Inage, Tomonori; Matsui, Yuji; and Ishizuka, Tazuko, 5,062,692, Cl. 359-45.000.

Matsumoto, Hidetoshi: *See*—
Sasaki, Kazuo; Matsumoto, Hidetoshi; and Ohoka, Taneji, 5,063,355, Cl. 328-129.100.

Matsumoto, Masashi: *See*—
Katsumata, Haruo; Sakai, Hiromichi; Takahashi, Keisuke; Ootaguro, Hirofumi; Matsumoto, Masashi; Nakamura, Moriyasu; and Ando, Tatsuo, 5,062,897, Cl. 106-696.000.

Matsumoto, Shunichiro; Inui, Tsutomu; Ichiyasu, Rokuo; and Chiba, Yoshitaka, to Hitachi Metals, Ltd. Rare earth metal-iron group metal target, alloy powder therefor and method of producing same. 5,062,885, Cl. 75-255.000.

Matsumoto, Toshimi: *See*—
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, 5,063,200, Cl. 505-1.000.

Matsuo, Kenji; Nonaka, Tadashi; and Tsuchiya, Ikuo, to Kabushiki Kaisha Toshiba. Semiconductor device having multi-layered wiring structure. 5,063,433, Cl. 357-71.000.

Matsuo, Shunji: *See*—
Haneda, Satoshi; Fukuchi, Masakazu; Matsuo, Shunji; and Morita, Shizuo, 5,063,411, Cl. 355-212.000.

Matsuoka, Hisao: *See*—
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,063,551, Cl. 369-48.000.

Matsushima, Hitoshi: *See*—
Yoda, Haruo; Miyatake, Takafumi; and Matsushima, Hitoshi, 5,063,492, Cl. 364-167.010.

Matsushita Electric Corporation of America: *See*—
Freitas, Joseph D., Jr.; Tatsumi, Yoshikazu; and Furukawa, Hiroyuki, 5,063,298, Cl. 250-497.100.

Matsushita Electric Industrial Co., Ltd.: *See*—
Imai, Akihiro; Kawakami, Tetsuji; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, 5,063,198, Cl. 503-227.000.
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 5,062,696, Cl. 359-554.000.
Sato, Takeo; Yamamoto, Masaki; Aoki, Shinichiro; Sugiyama, Yoshiyuki; Nakanishi, Yoshito; and Takeuchi, Hiroyuki, 5,062,705, Cl. 356-124.000.

Matsushita Electric Works Ltd.: *See*—
Maehara, Minoru; and Nagase, Haruo, 5,063,490, Cl. 363-37.000.

Matsushita Graphic Communication Systems, Inc.: *See*—
Murai, Hiroaki; Katano, Tatsuya; and Kikuchi, Shigeki, 5,063,398, Cl. 346-157.000.

Matsushita, Tomohisa: *See*—
Yazaki, Takashi; Matsushita, Tomohisa; and Nagase, Tsutomu, 5,063,061, Cl. 424-427.000.

Matsushita, Yasuo: *See*—
Maeda, Takeshi; Kawaguchi, Hiroshi; Yamaguchi, Harukazu; Sakai, Hitoshi; Ando, Akio; Matsushita, Yasuo; and Takemoto, Tetsuya, 5,062,926, Cl. 202-183.000.

Matsuzaki, Kunimitsu: *See*—
Kubo, Masao; Miyake, Tetsuo; Matsuzaki, Kunimitsu; and Kitagawa, Katsuji, 5,062,284, Cl. 72-46.000.

Matthew, Michael W.: *See*—
Adler-Golden, Steven; and Matthew, Michael W., 5,062,707, Cl. 356-311.000.

Matuszak, Edward A.: *See*—
Gillmore, Stephen R.; Merritt, Carleton G.; Chawan, Dhyaneshwar B.; and Matuszak, Edward A., 5,063,072, Cl. 426-557.000.

Maurer, Albert: *See*—
Gabathuler, Jean-Pierre; Eckert, Karl-Ludwig; Kaser, Peter; Maurer, Albert; and Fischer, Anton, 5,063,007, Cl. 264-44.000.

Maurice, D. V.: *See*—
Hulse, Sid D.; Maurice, D. V.; Ward, Nelson E.; and Wicker, David L., 5,063,066, Cl. 426-2.000.

Mawst, Luke J.: *See*—
Botez, Dan; Mawst, Luke J.; and Peterson, Gary L., 5,063,570, Cl. 372-50.000.

Maxworthy, Tony, to University of Southern California. Delta wing with lift enhancing flap. 5,062,595, Cl. 244-214.000.

Mayberry, John: *See*—
McArthur, James R.; Harrel, John; and Mayberry, John, 5,062,756, Cl. 414-22.510.

Mayers, John L.: *See*—
Worley, Kevin L.; Mayers, John L.; and Burchette, Herbert L., 5,062,767, Cl. 415-209.300.

Mazda Motor Corporation: *See*—
Edahiro, Takeshi; Takehara, Shin; Morita, Toshiki; and Kumada, Hiroyoshi, 5,062,659, Cl. 280-707.000.
Fukada, Hirotaka; Kondoh, Koichi; and Tsuchida, Tsuyoshi, 5,062,496, Cl. 180-291.000.
Murakami, Hiroshi; and Yamagata, Kazuko, 5,063,192, Cl. 502-303.000.
Yamane, Takakazu; Tanimoto, Yoshio; and Nakahama, Tadamitsu, 5,063,085, Cl. 427-240.000.

Mazoyer, Elisobeth M.: *See*—
Drouet, Ludovic O.; Bal Dit Sollier, Claire; Mazoyer, Elisobeth M.; Levy Toledano, Sylviane; Jolles, Pierre; and Fiat, Ann-Taiic D., 5,063,203, Cl. 514-8.000.

McArthur, Alastair: *See*—
Newton, Trevor W.; and McArthur, Alastair, 5,062,882, Cl. 71-93.000.

McArthur, James R.; Harrel, John; and Mayberry, John, to Harrel, John; and Harrel, Charlena, a part interest. Device for positioning and stabbing casing from a remote selectively variable location. 5,062,756, Cl. 414-22.510.

McCarten, Paul; and Slagowski, Eugene, to Beloit Corporation. Blanket for an extended nip press with anisotropic woven base layers. 5,062,924, Cl. 162-358.000.

McCarthy, William F.: *See*—
Herman, Philip A.; and McCarthy, William F., 5,063,362, Cl. 333-12.000.

McCauley, Durham S.; and Sullivan, Jeffrey R., to McGard, Inc. Pipe plug and centering construction for centering ridged key in mating groove in pipe plug or nut. 5,062,325, Cl. 81-436.000.

McClain, Michael J.: *See*—
Unterborn, Ralph J.; McClain, Michael J.; and Benner, Mark M., 5,062,176, Cl. 15-250.230.

McClenahan, Charles H. Firefighter's barrier penetrator and agent injector. 5,062,486, Cl. 169-70.000.

McClennen, Bill M.: *See*—
Carr, Daniel J.; Scally, Charles R.; McClennen, Bill M.; Carney, Michael D.; Volkoday, George; and Walsh, Thomas J., 5,063,392, Cl. 346-46.000.

McConachy, H. Reginald. High tower wind generating system. 5,062,765, Cl. 415-4.300.

McCormick, David R.: *See*—
Lindert, Andreas; Pierce, John R.; and McCormick, David R., 5,063,089, Cl. 427-354.000.

McCullough, T. Miles, to Betz Laboratories, Inc. Emulsion minimizing corrosion inhibitor for naphtha/water systems. 5,062,992, Cl. 252-394.000.

McDermott, Wayne T.; Ockovic, Richard C.; Wu, Jin J.; Cooper, Douglas W.; Schwarz, Alexander; and Wolfe, Henry L., to Air Products and Chemicals, Inc.; and International Business Machines Corporation. Surface cleaning using a cryogenic aerosol. 5,062,898, Cl. 134-7.000.

McDonald, Daniel P.: *See*—
Van Erden, Donald L.; McDonald, Daniel P.; and Ausnit, Steven, 5,063,069, Cl. 426-122.000.

McDonnell Douglas Corporation: *See*—
Blackmon, James B.; and Drubka, Robert E., 5,062,472, Cl. 165-41.000.
Timmons, Robert W., 5,062,457, Cl. 138-125.000.

McDowell, John F.: *See*—
Brown, J. Michael; McDowell, John F.; and Chang, Kin-Tai, 5,062,962, Cl. 210-698.000.

McGard, Inc.: *See*—
McCauley, Durham S.; and Sullivan, Jeffrey R., 5,062,325, Cl. 81-436.000.

McGill, George P.: *See*—
Wood, Alan G.; Farnworth, Warren M.; and McGill, George P., 5,062,565, Cl. 228-9.000.

McHugh, John: *See*—
McManigal, Donald P.; Yaksic, David G.; and McHugh, John, 5,062,669, Cl. 292-60.000.

McIntyre, John: *See*—
Hudson, Tom J.; McIntyre, John; Tremblay, Pierre; Allaire, Claude; and Gnyra, Bohdan, 5,062,929, Cl. 204-67.000.

McKeown, Nicholas W., to Hewlett-Packard Company. Network transceiver. 5,063,612, Cl. 455-607.000.

McKinney, Ray, Jr.: *See*—
Oh, Seik; and McKinney, Ray, Jr., 5,062,846, Cl. 606-158.000.

McMahan, David R.; Magengast, William E.; and Mateos, Luis A., to General Motors Corporation. Vehicle headlamp adjustment device. 5,063,480, Cl. 362-61.000.

McManigal, Donald P.; Yaksic, David G.; and McHugh, John. Secured locking device. 5,062,669, Cl. 292-60.000.

McMurray, William: *See*—
Roemer, Peter B.; Mueller, Otward M.; Park, John N.; and McMurray, William, 5,063,349, Cl. 324-322.000.

McPherson, Malcolm; and Ernest, Reinhold, to Grafotec Kotterer GmbH. Method and an apparatus for bonding together at least two running lengths of material. 5,062,919, Cl. 156-356.000.

McRae, Howard F., to Champlain Cable Corporation. Non-halogenated insulation with high oxygen index. 5,063,266, Cl. 524-269.000.

McWilliams, John P.: *See*—
Kirker, Garry W.; Klocke, Donald J.; Vartuli, James C.; Chu, Pochen; Marler, David O.; and McWilliams, John P., 5,063,038, Cl. 423-328.000.

Meagher, Brian R., to Katun Corporation. Spool with resilient tab for storing and dispensing filamentary material. 5,062,580, Cl. 242-125.200.

Meakin, Douglas B., to General Electric Company p.l.c., The. Vacuum deposition process and apparatus for producing films having high uniformity. 5,063,086, Cl. 427-255.300.

Medevelop AB: *See*—
Branemark, Per-Ingvar, 5,062,851, Cl. 623-18.000.

Medex, Inc.: *See*—
Toomey, John C., 5,063,178, Cl. 422-82.070.

Meehan, Kathleen: *See*—
Beyea, Dana M.; and Meehan, Kathleen, 5,063,174, Cl. 437-184.000.

Melanotte, Massimo; and Bellezza, Orio, to SGS-Thomson Microelectronics s.r.l. UPROM memory cell integrable with a tablecloth matrix EPROM. 5,063,424, Cl. 357-23.500.

Menashi, Jameel; and Koehlert, Kenneth C., to Cabot Corporation. Process for making non-porous micron-sized high purity silica. 5,063,179, Cl. 501-12.000.

Mendoza, Roel: *See*—
Wirtz, John W.; Yanik, David; Rader, Robert R.; Mendoza, Roel; and Essig, Dennis E., 5,062,762, Cl. 414-786.000.

Menon, Vinod: *See*—
Kagawa, Koichi; Yu, Chung-Li; Kaku, Shinkyo; and Menon, Vinod, 5,063,526, Cl. 395-155.000.

Mentor Corporation: *See*—
Cowen, Timothy B., 5,062,417, Cl. 128-79.000.

Mentzer, Nancy E., to Armstrong World Industries, Inc. Simulated marble and process of preparation. 5,063,093, Cl. 428-15.000.

Mercedes-Benz AG: *See*—
Arold, Klaus; and Bruhnke, Ulrich, 5,062,353, Cl. 98-2.110.

Mercer, James B.: *See*—
Kubisch, John G.; Mercer, James B.; Schaeff, Wilmer G.; and Wenzel, Thomas E., 5,062,466, Cl. 164-7.100.

Mercurio, Joseph F.; and Cantio, Salvador, to General Motors Corporation. Method for installing O-ring seals. 5,062,194, Cl. 29-451.000.

Merlin Gerin: *See*—
Terracol, Claude; Bredel, Patrick; and Guillet, Jean-Laurent, 5,062,525, Cl. 198-468.600.

Merrell Dow Pharmaceuticals Inc.: *See*—
Sunkara, Sai P.; and Jones, Winton D., 5,063,238, Cl. 514-340.000.

Merrimac Industries, Inc.: *See*—
Cappucci, Joseph D., 5,063,365, Cl. 333-121.000.

Merriman, Burt T., Jr.; and Goff, David L., to Du Pont de Nemours, E. I., and Company. Electronic device coated with a polyimide coating composition. 5,063,115, Cl. 428-447.000.

Merritt, Carleton G.: *See*—
Gillmore, Stephen R.; Merritt, Carleton G.; Chawan, Dhyaneshwar B.; and Matuszak, Edward A., 5,063,072, Cl. 426-557.000.

Messner, Helmut, to Bruderer AG. Apparatus for controlling the feed of an intermittent web-feeding apparatus. 5,062,561, Cl. 226-152.000.

Metal Tech, Inc.: *See*—
Buzzella, David, 5,062,250, Cl. 52-584.000.

Metrohm AG: *See*—
Zahner, Paul; and Kaempf, Karl, 5,062,547, Cl. 222-144.500.

Metzger, Robert E.: *See*—
Butler, Johnny L.; Wakeland, Richard E.; Batson, Donald R.; and Metzger, Robert E., 5,062,439, Cl. 137-15.000.

Meyer, Dieter: *See*—
Fabry, Ehrenfried; Goddard, Georg; Meyer, Dieter; Petermann, Hans; Pirkl, Bernhard; and Wiedemann, Werner, 5,063,379, Cl. 340-784.000.

Meyer, Gunter: *See*—
Durselen, Heinz; Schuffler, Arnulf; and Meyer, Gunter, 5,062,925, Cl. 201-41.000.

Meyer, Norbert: *See*—
Plath, Peter; Eicken, Karl; Goetz, Norbert; Wild, Jochen; Meyer, Norbert; and Wuerzer, Bruno, 5,062,884, Cl. 71-95.000.

Meyers, Lawrence D.: *See*—
Lipton, Lenny; and Meyers, Lawrence D., 5,063,441, Cl. 358-88.000.

MFM Technology, Inc.: *See*—
Foley, Thomas P.; and Mosciatti, Roger, 5,062,384, Cl. 118-500.000.

Miba Gleitlager Aktiengesellschaft: *See*—
Lenhard-Backhaus, Hugo; Ehrentraut, Otto; and Haager, Ottmar, 5,062,718, Cl. 384-294.000.

Michael, James V., to Senco Products, Inc. Portable power fastening tool. 5,062,562, Cl. 227-111.000.

Michal, Vratislav M.; and Barbaro, Ralph S., to Eastman Kodak Company. Apparatus and method for edge notching a continuously moving web. 5,062,331, Cl. 83-37.000.

Micheletti, Bejrouth M. Washing apparatus and process. 5,062,438, Cl. 134-9.000.

Micron Technology, Inc.: *See*—
Wood, Alan G.; Farnworth, Warren M.; and McGill, George P., 5,062,565, Cl. 228-9.000.

Middleby Corporation: *See*—
Whitesel, J. Warren; and Cooper, Larry, 5,062,408, Cl. 126-41.00R.

Mier, Randall M.: *See*—
Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; and Wieck, Henry J., 5,063,081, Cl. 427-2.000.

Migdal, Cyril A.; and Jenkins, Robert H., Jr., to Texaco Inc. Polymeric step ladder polysuccinimide compositions suitable for lubricating oil dispersants and fuel additives. 5,062,980, Cl. 252-51.50A.

Migliori, Albert, to United States of America, Energy. Resonant ultrasound spectroscopy. 5,062,296, Cl. 73-579.000.

Mihayashi, Keiji: *See*—
Abe, Akira; Fujita, Yoshihiro; and Mihayashi, Keiji, 5,063,131, Cl. 430-372.000.

Mikhail, Ameer G., to United States of America, Army. Detached and attached thermal spoilers for kinetic energy projectile fins. 5,062,585, Cl. 244-3.240.

Miki, Shogo: *See*—
Nomura, Takuji; Miki, Shogo; Sakauchi, Takashi; Sato, Yoshitaka; and Honma, Yuusuke, 5,062,981, Cl. 252-62.540.

Milillo, Richard J., to Xerox Corporation. Document illumination assembly adapted to reduce platen overheating. 5,063,404, Cl. 355-30.000.

Miller, Alan B.: *See*—
Wenskus, James J., Jr.; and Miller, Alan B., 5,063,008, Cl. 264-40.500.

Miller, Brian S.; and Kaplan, David R., to United States of America, Army. Method of making a flexible membrane circuit tester. 5,062,203, Cl. 29-852.000.

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Miller, Jack E.; Fowler, Joe R.; Fox, Stewart A.; and Lane, Bryan, to National-Oilwell. Connection seal. 5,062,667, Cl. 285-381.000.

Miller, James E.: *See*—
Shurtz, Richard R., II; Sharp, Edward J.; and Miller, James E., 5,063,418, Cl. 357-15.000.

Miller, John W.: *See*—
Mason, John G.; Miller, John W.; Sauerwein, William D.; and Vick, Stephen L., 5,063,319, Cl. 310-210.000.

Miller, Michael S.: *See*—
Goetz, Frederick E.; Miller, Michael S.; and Shelton, Homer, Jr., 5,062,671, Cl. 292-175.000.

Miller, Nigel D., to Smith & Nephew plc. Hypoadherent dressings comprising liquid pervious polymer coating of polyurethane containing siloxane residues. 5,063,063, Cl. 424-445.000.

Miller, Randolph D. Pole-latch attachment for jet ski. 5,062,377, Cl. 114-270.000.

Miller, Robert E.; and Eichelberger, F. Jay, Jr., to Ford New Holland, Inc. Low profile cart for the insitu collection filteration and recycle of fluids from machinery. 5,062,500, Cl. 184-106.000.

Millipore Corporation: *See*—
Rising, Donald B.; and Montminy, Emile O., 5,062,308, Cl. 73-864.410.

Mills, Larry R.: *See*—
Berry, Troy R.; and Mills, Larry R., 5,062,642, Cl. 273-183.00B.

Mimura, Nobuharu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Articulated hand. 5,062,673, Cl. 294-111.000.

Minabe, Kohji: *See*—
Owashi, Hitoaki; Ohtsubo, Hiroyasu; Sekiya, Masataka; Minabe, Kohji; Nishijima, Hideo; Masuda, Michio; and Rokuda, Morito, 5,063,437, Cl. 358-22.000.

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Mincher, William H. Security rail. 5,062,612, Cl. 256-11.000.

Mine, Atsushi: *See*—
Kamimura, Katsuyoshi; Mine, Atsushi; and Hiwatashi, Yutaka, 5,063,512, Cl. 364-424.050.

Minegishi, Masami, to Fuji Jukogyo Kabushiki Kaisha. Diesel engine shut-down device. 5,062,400, Cl. 123-198.0DB.

Minnesota Mining and Manufacturing Company: *See*—
Andrews, Jeffrey F., 5,063,249, Cl. 514-673.000.
Budd, Kenton D., 5,063,199, Cl. 505-1.000.
Burns, James A.; and Reischel, Joseph G., 5,062,421, Cl. 128-205.270.
Cleary, James D.; and Eckert, Robert P., 5,062,793, Cl. 433-3.000.
Gunther, Werner T., 5,062,251, Cl. 53-134.100.
Hardenbrook, James M.; Williams, Richard E.; and Daniel, Mark L., 5,063,297, Cl. 250-458.100.
Matson, Charles J.; and Velasquez, David J., 5,062,423, Cl. 128-207.150.
Tristani-Kendra, Miguel G.; and Papapolymerou, George, 5,062,691, Cl. 359-56.000.
Minolta Camera Co., Ltd.: *See*—
Nakatani, Munehiro; Yamada, Hirokazu; and Kishi, Masamichi, 5,063,459, Cl. 358-404.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ariyama, Takayuki, 5,063,415, Cl. 355-312.000.
Iwasaki, Satoshi, 5,062,695, Cl. 359-689.000.
Kinoshita, Naoyoshi; and Kusumoto, Keiji, 5,063,410, Cl. 355-204.000.
Oka, Tateki; and Yokoyama, Tomoaki, 5,063,127, Cl. 430-45.000.
Shimada, Takahisa; Yamaki, Toshio; Tsuji, Kenji; Nakai, Masaaki; Fujino, Akihiko; and Ootsuka, Hiroshi, 5,063,402, Cl. 354-400.000.
Mirzamaani, Seyyed M. T.: *See*—
Edmonson, David A.; Ivett, Peter R.; Johnson, Kenneth E.; Mirzamaani, Seyyed M. T.; and Ward, James F., Jr., 5,063,120, Cl. 428-694.000.
Missler, Patrick. Horizontal band-saw. 5,062,335, Cl. 83-168.000.
Mita Industrial Co., Ltd.: *See*—
Nakatani, Kaname; Hanatani, Yasuyuki; and Mizuta, Yasufumi, 5,063,126, Cl. 430-59.000.
Mitani, Hiroshi: *See*—
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 5,062,696, Cl. 359-554.000.
Mitchell, Phillip R. Portable microscope apparatus. 5,062,697, Cl. 359-379.000.
Mitsubishi Denki Kabushik Kaisha: *See*—
Minami, Hiroshi; and Fujita, Koreaki, 5,063,305, Cl. 307-304.000.
Mitsubishi Denki K.K.: *See*—
Iwata, Toshio, 5,062,294, Cl. 73-115.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Amano, Masaaki, 5,062,502, Cl. 187-124.000.
Haruta, Yasumasa, 5,062,519, Cl. 190-333.000.
Ikeda, Hideo; Hamamura, Chiyo; Satoh, Hiroshi; and Utsui, Yoshihiko, 5,062,307, Cl. 73-862.360.
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,063,546, Cl. 369-32.000.
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Miwa, Hiroshi; Miyoshi, Atuko; Satou, Syungi; and Kaseda, Masayuki, 5,063,528, Cl. 364-559.000.
Semasa, Takayoshi; and Ueno, Yutaka, 5,063,587, Cl. 379-53.000.
Shimura, Teruyuki, 5,063,167, Cl. 437-31.000.
Takeda, Masatoshi; Aritsuka, Tomohiko; and Tachibana, Yoshitaka, 5,063,532, Cl. 364-825.000.
Mitsubishi Gas Chemical Company Inc.: *See*—
Murayama, Katsutoshi; and Nagai, Hideaki, 5,063,250, Cl. 518-704.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Murayama, Katsutoshi; and Nagai, Hideaki, 5,063,250, Cl. 518-704.000.
Mitsubishi Kasei Corporation: *See*—
Katsumata, Haruo; Sakai, Hiromichi; Takahashi, Keisuke; Ootaguro, Hirofumi; Matsumoto, Masashi; Nakamura, Moriyasu; and Ando, Tatsuo, 5,062,897, Cl. 106-696.000.
Sekiya, Tetsuo; Inoue, Shinya; Taniguchi, Masao; Umezu, Kohei; and Suzuki, Kazuo, 5,063,247, Cl. 514-585.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Sukekawa, Izumi; Asao, Haruhiko; Kohno, Hiroshi; Sugawara, Yukio; and Nogami, Keiji, 5,062,614, Cl. 266-216.000.
Mitsubishi Paper Mills Limited: *See*—
Goto, Atsuo; Okumura, Fumio; and Ito, Kazuhiko, 5,063,197, Cl. 503-209.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Kawazoe, Tetsu; and Iida, Tsukasa, 5,062,948, Cl. 208-251.00R.
Mitsuya, Yoshihide: *See*—
Kageyama, Shubei; Kageyama, Toshihiko; Nakazato, Youichi; and Mitsuya, Yoshihide, 5,062,727, Cl. 401-52.000.
Mitsuyama, Masuhiro. Compact file for letters and other documents. 5,062,530, Cl. 206-425.000.
MIU Automation Corporation: *See*—
Dyke, John, 5,063,596, Cl. 380-49.000.
Miura, Fujio, to GAC International, Inc. Orthodontic appliance with shoulder support for ligature. 5,062,794, Cl. 433-10.000.
Miura, Haruo; Fukushima, Yasuo; Nishida, Hideo; Kobayashi, Hiromi; and Takagi, Takeo, to Hitachi, Ltd. Turbo compressor. 5,062,766, Cl. 415-199.100.
Miwa, Hiroshi; Miyoshi, Atuko; Satou, Syungi; and Kaseda, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Record position measuring apparatus. 5,063,528, Cl. 364-559.000.
Mix, Thomas W. Packing elements. 5,063,000, Cl. 261-94.000.
Miyagawa, Naoomi; Yoshida, Chiyoaki; Toda, Kazuyuki; and Nakamura, Yukiyasu, to Yamazaki Mazak Kabushiki Kaisha. Press brake and a workpiece measuring method in the press brake. 5,062,283, Cl. 72-10.000.
Miyake, Tetsuo: *See*—
Kitagawa, Katsuji; Moriguchi, Kazutomo; Miyake, Tetsuo; Sano, Katusya; Kittaka, Kiyoshi; and Sakakibara, Tetsuya, 5,063,095, Cl. 428-35.800.
Kubo, Masao; Miyake, Tetsuo; Matsuzaki, Kunimitsu; and Kitagawa, Katsuji, 5,062,284, Cl. 72-46.000.
Miyamae, Toshiyuki: *See*—
Yamada, Yasuhiko; Tomio, Minaki; Miyamae, Toshiyuki; and Kawai, Norio, 5,062,618, Cl. 267-140.400.
Miyamoto, Hiroshi: *See*—
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Miyao, Hidehiko; Ikeda, Satoshi; Shiotsuki, Masao; Kawamura, Shigeyoshi; Komatsu, Fumiaki; Takagi, Ikuji; and Sakai, Tadamiti, to Kabushiki Kaisha Kobe Seiko Sho; and Doryokuro Kakunenryo Kaihatsu Jigyodan. Method of compacting radioactive metal wastes. 5,063,001, Cl. 264-0.500.
Miyashita, Hiroshi; Hamamoto, Hideotoshi; Nagai, Shigeru; Yamaguchi, Makoto; Isao, Onuki; Takahashi, Hiroshi; and Ishiguro, Atsushi, to Pentel Kabushiki Kaisha. Water-based ink composition for ball-point pen. 5,062,890, Cl. 106-27.000.
Miyatake, Takafumi: *See*—
Yoda, Haruo; Miyatake, Takafumi; and Matsushima, Hitoshi, 5,063,492, Cl. 364-167.010.
Miyoshi, Atuko: *See*—
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Miyoshi, Hiroshi; Kamatani, Yoshiteru; Ozue, Tadashi; Narahara, Tatsuya; and Ohsato, Kiyoshi, to Sony Corporation. Rotary optical head. 5,063,555, Cl. 369-97.000.
Mizukura, Noboru: *See*—
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Mizuno, Hiroshige; Abe, Fumio; and Harada, Takashi, to NGk Insulators, Ltd. Resistance adjusting type heater and catalytic converter. 5,063,029, Cl. 422-175.000.
Mizuno, Toru; and Morikawa, Shigehiro, to Fanuc Ltd. Weaving welding method. 5,063,281, Cl. 219-125.120.
Mizunoya, Nobuyuki: *See*—
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Nakatani, Kaname; Hanatani, Yasuyuki; and Mizuta, Yasufumi, 5,063,126, Cl. 430-59.000.
Mizutani, Shoji; and Taneda, Nobuo, to Teijin Limited. Process for preparation of hollow fibers for fluid separator construction. 5,063,009, Cl. 264-49.000.
Mizutani, Takehito: *See*—
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Mobay Corporation: *See*—
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Audeh, Costandi A., 5,062,976, Cl. 252-45.000.
Coles, Mary E.; and Muegge, Ernest L., 5,063,509, Cl. 364-420.000.
Humble, John D.; Searles, Raymond C.; Ruggles, John D.; and Jacobowitz, Judah L., 5,063,028, Cl. 422-144.000.
Kirker, Garry W.; Klocke, Donald J.; Vartuli, James C.; Chu, Pochen; Marler, David O.; and McWilliams, John P., 5,063,038, Cl. 423-328.000.
Leib, Tiberiu M.; and Sapre, Ajit V., 5,062,944, Cl. 208-113.000.
Pappal, David A.; and Schipper, Paul H., 5,062,945, Cl. 208-113.000.
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Mochida, Mitsuyoshi: *See*—
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Moeller, Larry F.: *See*—
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Molex Incorporated: *See*—
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Mondini, Gian-Carlo; and Ackeret, Walter, to Rieter Machine Works Limited. Lap feed plate connected to oscillating nippers in a combing machine. 5,062,183, Cl. 19-225.000.

Monnier, Christian, to Societe d'Applications Generales d'Electricite et de Mecanique Sagem. Instrument danel assembly for motor vehicle dashboard. 5,062,604, Cl. 248-27.100.
Monsanto Company: *See*—
Patterson, Dennis R., 5,062,880, Cl. 71-92.000.
Monte, Louis H.; Jeyarajan, Arunachalam; and Graham, Lawrence D., to PCC Airfoils, Inc. Mold and method for casting a single crystal metal article. 5,062,468, Cl. 164-122.200.
Monte, Louis H.; Jeyarajan, Arunachalam; and Graham, Lawrence D., to PCC Airfoils, Inc. Mold and method for casting a single crystal metal article. 5,062,469, Cl. 164-122.200.
Montefibre S.p.A.: *See*—
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Montminy, Emile O.: *See*—
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Mooney, John B.; and Sher, Arden, to SRI International. Method of forming a low dislocation density semiconductor device. 5,063,166, Cl. 437-22.000.
Moore Business Forms, Inc.: *See*—
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Moore, Joel D.: *See*—
Bateson, George F.; Chresand, Thomas J.; Moore, Joel D.; and Nayes, Terrence L., 5,062,958, Cl. 210-611.000.
Moore, Sanders H.: *See*—
Dotson, Ronald L.; and Moore, Sanders H., 5,062,966, Cl. 210-753.000.
Moose, Paul H. Multi-frequency differentially encoded digital communication for high data rate transmission through unequalized channels. 5,063,574, Cl. 375-27.000.
Morgan, Leslie, to Wiggins Teape Group Limited, The. Rope system for a paper machine coating or size press section. 5,062,923, Cl. 162-265.000.
Morgenstern, Herbert: *See*—
Bauer, Peter; Konrad, Rainer; Morgenstern, Herbert; and Schuch, Horst, 5,063,016, Cl. 264-211.210.
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Mori, Shojiro, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit device having standard cells including internal wiring region. 5,063,430, Cl. 357-45.000.
Mori, Tetsuzo; Sakamoto, Eiji; Hara, Shinichi; Uda, Koji; Shimoda, Isamu; Uzawa, Shunichi; and Ozawa, Kunitaka, to Canon Kabushiki Kaisha. Liquid cooled X-ray lithographic exposure apparatus. 5,063,582, Cl. 378-34.000.
Moriguchi, Kazutomo: *See*—
Kitagawa, Katsuji; Moriguchi, Kazutomo; Miyake, Tetsuo; Sano, Katusya; Kittaka, Kiyoshi; and Sakakibara, Tetsuya, 5,063,095, Cl. 428-35.800.
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Morita, Ikuo: *See*—
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Morris, William M. Mowing apparatus. 5,062,257, Cl. 56-11.100.
Morrison, Kenneth G.: *See*—
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Mortensen, Anders, to Dansk Industri Syndikat A/S. Procedure for conveying molds, and a plant for that purpose. 5,062,465, Cl. 164-4.100.
Morton, Jay, to City of Hope; and Morton, Lucille T. Easy-open and reclosable container. 5,062,542, Cl. 220-269.000.
Morton, Lucille T.: *See*—
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Mosher, Gerold L.; and Mullen, Michael V., to Eli Lilly and Company. R-cefuroxime axetil. 5,063,224, Cl. 514-202.000.
Motorola, Inc.: *See*—
Erhart, Richard A.; Herold, Barry W.; and DeLuca, Joan S., 5,063,533, Cl. 395-425.000.
Kalenowsky, John A., 5,063,340, Cl. 320-1.000.
Patsiokas, Stelios J.; Johnson, Brian Keith A.; and Audet, Pierre E., 5,063,588, Cl. 379-57.000.
Peterson, William M.; Hume, Christopher N.; and Leivian, Robert H., 5,063,521, Cl. 395-27.000.
Sigmon, Bernard E., 5,063,360, Cl. 331-175.000.
Swapp, Mavin C., 5,063,311, Cl. 307-603.000.
Williams, William R.; and Callaway, Edgar H., Jr., 5,063,357, Cl. 331-49.000.
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Moulinet, Francois, to Glaenzer Spicer. Arrangement of a protective cover on the socket of a transmission joint. 5,062,821, Cl. 464-111.000.
Mower, Vaughn L., to Unisys Corporation. Doppler frequency compensation circuit. 5,063,387, Cl. 342-103.000.
Mowry, William H.; Schuelke, James H.; and White, Robert L., to Standard Register Company, The. Financial instrument and method of making. 5,062,666, Cl. 283-67.000.
Mu, Albert T., to Advanced Micro Devices, Inc. Integrated circuit lead assembly structure with first and second lead patterns spaced apart in parallel planes with a part of each lead in one lead pattern perpendicular to a part of each lead in the other lead pattern. 5,063,432, Cl. 357-70.000.
Muchmore, Robert A.; and Roth, William H., to General Motors Corporation. Tuned damper for a torque converter clutch. 5,062,517, Cl. 192-106.200.
Muck, Jack E.: *See*—
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Muhlethaler, Erhard, to Lanz Oensingen AG. Cable-laying conduit. 5,062,605, Cl. 248-68.100.
Muia, Ramon A.; and Donlan, Rodney M., to Calgon Corporation. Method for controlling zebra mussels using didecyl dimethyl ammonium halides. 5,062,967, Cl. 210-755.000.
Muijs, Herman M.; Beers, Nicolaas C. M.; and Roefs, Sebastianus P. F. M., to Shell Oil Company. Surfactant composition. 5,062,970, Cl. 252-8.554.
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Mullen, Michael V.: *See*—
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Murai, Hiroaki; Katano, Tatsuya; and Kikuchi, Shigeki, to Matsushita Graphic Communication Systems, Inc. Color image recording apparatus. 5,063,398, Cl. 346-157.000.
Murai, Yukio: *See*—
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Murakami, Hiroshi; and Yamagata, Kazuko, to Mazda Motor Corporation. Catalyst for purification of exhaust gases. 5,063,192, Cl. 502-303.000.
Murakami, Takuya: *See*—
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Muramatsu, Kimio: *See*—
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Muraoka, Kunihiko: *See*—
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Muraoka, Yutaka: *See*—
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Sato, Masahide, 5,062,619, Cl. 267-154.000.

Nabisco Brands, Inc.: *See*—
Klemann, Lawrence P.; and Finley, John W., 5,063,070, Cl. 426-271.000.
Yarger, Ronald G.; Klemann, Lawrence P.; and Finley, John W., 5,063,075, Cl. 426-601.000.

Naeder, Max, to Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-Kommanditgesellschaft. Prosthetic foot having Z shaped insert. 5,062,859, Cl. 623-55.000.

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Miyashita, Hiroshi; Hamamoto, Hideotoshi; Nagai, Shigeru; Yamaguchi, Makoto; Isao, Onuki; Takahashi, Hiroshi; and Ishiguro, Atsushi, 5,062,890, Cl. 106-27.000.

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Yoshimura, Katsuji; Aoki, Akio; Shimokoriyama, Makoto; Kashida, Motokazu; Yamashita, Shinichi; and Nagasawa, Kenichi, 5,063,453, Cl. 360-32.000.

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Yazaki, Takashi; Matsushita, Tomohisa; and Nagase, Tsutomu, 5,063,061, Cl. 424-427.000.

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Nagato, Hitoshi, to Kabushiki Kaisha Toshiba. Thermal recording apparatus and print head. 5,063,394, Cl. 346-76.0PH.

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Inaba, Yoshiharu; Naito, Hideo; Kamiguchi, Masao; Neko, Noriaki; and Sakakibara, Shinsuke, 5,062,784, Cl. 425-143.000.

Naitou, Osamu: *See*—
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Yamane, Takakazu; Tanimoto, Yoshio; and Nakahama, Tadamitsu, 5,063,085, Cl. 427-240.000.

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Shimada, Takahisa; Yamaki, Toshio; Tsuji, Kenji; Nakai, Masaaki; Fujino, Akihiko; and Ootsuka, Hiroshi, 5,063,402, Cl. 354-400.000.

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Chiba, Kazuharu; Nakajima, Yoshifumi; and Sumiyoshi, Hideo, 5,063,568, Cl. 372-32.000.

Nakajima, Yoshiki: *See*—
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,063,546, Cl. 369-32.000.

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Noguchi, Yasuhiro, 5,062,579, Cl. 242-68.300.
Tandai, Takahiko, 5,063,469, Cl. 360-128.000.

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Katsumata, Haruo; Sakai, Hiromichi; Takahashi, Keisuke; Ootaguro, Hirofumi; Matsumoto, Masashi; Nakamura, Moriyasu; and Ando, Tatsuo, 5,062,897, Cl. 106-696.000.

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Arita, Yoshikazu; Iizuka, Toshi; Abe, Yukio; Nakamura, Yoshio; Takigami, Shoji; and Takigami, Machiko, 5,063,042, Cl. 423-447.400.
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Kageyama, Shubei; Kageyama, Toshihiko; Nakazato, Youichi; and Mitsuya, Yoshihide, 5,062,727, Cl. 401-52.000.

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Hirose, Takeshi; Abe, Akira; and Nakazyo, Kiyoshi, 5,063,143, Cl. 430-419.000.

Nakos, Steven T., to Loctite Corporation. MTQ/polysiloxane hybrid resins, method of making the same, and coating/potting compositions containing the same. 5,063,254, Cl. 522-43.000.

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Reiling, Victor G.; and Dean, Bryan L., 5,062,341, Cl. 84-702.000.
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Miller, Jack E.; Fowler, Joe R.; Fox, Stewart A.; and Lane, Bryan, 5,062,667, Cl. 285-381.000.
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Peters, Timothy J.; and Raja, Kishor B., 5,063,205, Cl. 514-12.000.
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Bobba, Ram S., 5,063,383, Cl. 341-120.000.
Manley, Martin H., 5,063,172, Cl. 437-43.000.
Vora, Madhukar B., 5,063,168, Cl. 437-31.000.
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Bakirov, Murat B.; Getman, Alexandr F.; Gribov, Boris I.; Bordjugovsky, Andrei A.; and Klimenok, Alexandra P., 5,062,293, Cl. 73-81.000.
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NCR Corporation: *See—*
Crafts, Harold S., 5,063,429, Cl. 357-40.000.
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Paggen, Wolfgang; and Neblich, Josef, 5,063,477, Cl. 361-384.000.
NEC Corporation: *See—*
—Eguchi, Mikiro; and Sato, Hideto, 5,063,576, Cl. 375-111.000.
—Inaba, Katsuhiko, 5,063,489, Cl. 363-21.000.
—Kawai, Shigeru; and Kubota, Keiichi, 5,063,531, Cl. 395-25.000.
—Okajima, Masayuki; and Shibuya, Toru, 5,063,443, Cl. 358-133.000.
—Okamoto, Satoru; Terazi, Kazufumi; Nishino, Seiichi; and Bonkohara, Manabu, 5,063,435, Cl. 357-74.000.
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—Takahashi, Hiroyuki, 5,063,540, Cl. 365-175.000.
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Honda, Ryoji; Kita, Masahiro; and Negoro, Ikuo, 5,063,416, Cl. 355-316.000.
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Nelson, Riley H., to 859545 Ontario Ltd. Gymnastic training device. 5,062,630, Cl. 272-111.000.
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Nelson, Thomas E. Animal litter containing an improved clay. 5,062,383, Cl. 119-173.000.
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Nepon Company, Ltd: *See—*
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Netravali, Arun N.: *See—*
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Nettles, James A.: *See—*
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Neuman, Clayton L., to A-1 Engineering, Inc. Injection molding filter. 5,062,952, Cl. 210-232.000.
Neustat, Paula; and Marchiony, Larry, to Burlington Industries, Inc. Fabric sample display. 5,062,534, Cl. 211-48.000.
Newbold, George T., to Martin Archery, Inc. Arrow rest and arrow launcher adjustment apparatus. 5,062,407, Cl. 124-44.500.
Newton, Trevor W.; and McArthur, Alastair, to Shell International Research Maatschappij B. V. Triazine herbicides. 5,062,882, Cl. 71-93.000.
NGk Insulators, Ltd.: *See—*
Mizuno, Hiroshige; Abe, Fumio; and Harada, Takashi, 5,063,029, Cl. 422-175.000.
NGK Spark Plug Co., Ltd.: *See—*
Tsuge, Kazuto; Hattori, Masateru; Kondo, Kazuo; and Shibata, Yoshimasa, 5,062,798, Cl. 433-201.100.
Ngo, Khai D.; and Charles, Richard J., to General Electric Company. Dual-permeability core structure for use in high-frequency magnetic components. 5,062,197, Cl. 29-606.000.
Nguyen, Dat; Sansevero, Frank; Johnson, Gerald E.; and Rivera, James A., to Otis Elevator Company. Self adjustable handrail drive with separate drive chains. 5,062,520, Cl. 198-335.000.
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Nieuwenhuize, O. V.; de Grunt, F.; de Visser, S.; and Vos, R., to Avery Dennison Corporation. Thermoplastic plasticizer-resistant film and pressure-sensitive adhesive film comprising the plasticizer-resistant film. 5,063,106, Cl. 428-343.000.
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Nihon Tokushu Noyaku Seizo K.K.: *See—*
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Niigata, Kunihiro: *See—*
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Nikon Corporation: *See—*
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Iida, Yoshikazu; Sakamoto, Hiroshi; and Matsui, Hideki, 5,063,403, Cl. 354-413.000.
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Nippon Seiko Kabushiki Kaisha: *See—*
—Chiba, Moichi, 5,062,721, Cl. 384-536.000.
Nippon Sheet Glass Co., Ltd.: *See—*
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Nippon Telegraph and Telephone Corporation: *See—*
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Sugawara, Tomoo; and Yamato, Motoyuki, 5,063,103, Cl. 428-285.000.
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—Hirata, Toshio; Ogura, Kenji; and Mizutani, Takehito, 5,062,275, Cl. 62-174.000.
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Nishino, Yu: *See*—
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Nishio, Yukio; and Hirose, Kazonori, to Fujitsu Limited. Open-cell foam developing roller. 5,062,385, Cl. 118-653.000.
Nishiura, Yosuke: *See*—
Yoneyama, Masakazu; Yamada, Ryosuke; Nishiura, Yosuke; Makekawa, Yukio; Higaki, Yuzo; and Iwamoto, Yoshiaki, 5,063,147, Cl. 430-523.000.
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Nissan Motor Co., Ltd.: *See*—
Akiyama, Takeo, 5,063,345, Cl. 324-173.000.
Kakimoto, Toshihiko; and Murakami, Takuya, 5,062,654, Cl. 280-673.000.
Ogata, Hisashi, 5,062,497, Cl. 180-300.000.
Satoh, Masaharu; Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Fukuyama, Kensuke, 5,062,660, Cl. 280-707.000.
Watanuki, Yoshio; Mochida, Haruo; Inoue, Masaru; Suzuki, Kazuya; and Tanaka, Masaki, 5,062,312, Cl. 74-89.140.
Nisshin Chemical Industry Co., Ltd.: *See*—
Saitoh, Izumi; and Sasaki, Yoshio, 5,063,048, Cl. 424-59.000.
Nissin Electric Co., Ltd.: *See*—
Kanba, Masaru; Inoue, Yasuo; Mukai, Sadayoshi; Kikkawa, Masanari; and Suga, Yasunori, 5,062,292, Cl. 73-19.010.
Nitto Boseki Co., Ltd.: *See*—
Nagasawa, Takeshi; Gemba, Yuko; Nakamura, Yoshio; and Kuroiwa, Katsumasa, 5,063,152, Cl. 435-24.000.
Niwa, Kenji: *See*—
Marcinkowski, John; Bennett, Herbert W.; and Niwa, Kenji, 5,062,963, Cl. 210-712.000.
Niwa, Takahiro; and Shimizu, Yasuo, to Nichias Corporation. Vibration damping materials and soundproofing structures using such damping materials. 5,063,098, Cl. 428-76.000.
Niznick, Gerald A., to Core-Vent Corporation. Dental implant handle, and dental implant package including a dental implant handle. 5,062,800, Cl. 433-229.000.
NKK Corporation: *See*—
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,062,906, Cl. 148-111.000.
Nobel Kemi AB: *See*—
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Noble, Philip C.; and Padgett, Mary B., to Pfizer Hospital Products Group. Prosthetic device and method of implantation. 5,062,854, Cl. 623-23.000.
Nobue, Kazuo: *See*—
Inomata, Mitsugu; Nakao, Fumio; Maekawa, Takashi; Uchiyama, Kaneastu; Endo, Tetsu; Nobue, Kazuo; Shimazaki, Masaki; and Idouji, Shigeki, 5,062,726, Cl. 400-630.000.
Nogami, Keiji: *See*—
Sukekawa, Izumi; Asao, Haruhiko; Kohno, Hiroshi; Sugawara, Yukio; and Nogami, Keiji, 5,062,614, Cl. 266-216.000.
Noguchi, Makoto, to Yokohama Rubber Co., Ltd., The. Pneumatic tire having a tread pattern for reducing noise. 5,062,461, Cl. 152-209.00R.
Noguchi, Yasuhiro, to Nakamichi Corporation. Reel shaft in magnetic tape cassette recording and/or reproducing. 5,062,579, Cl. 242-68.300.
Nojo, Shigenobu: *See*—
Inagawa, Hideho; and Nojo, Shigenobu, 5,063,280, Cl. 219-121.700.
Nomoto, Yuji; Takai, Haruki; Ohno, Tetsuji; and Kubo, Kazuhiro, to Kyowa Hakko Kogyo Co., Ltd. Quinazoline-substituted pyridazinone derivatives having cardiotonic activity. 5,063,227, Cl. 514-252.000.
Nomura, Satoru: *See*—
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,063,551, Cl. 369-48.000.
Nomura, Takuji; Miki, Shogo; Sakauchi, Takashi; Sato, Yoshitaka; and Honma, Yuusuke, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Magnet and method for manufacturing the same. 5,062,981, Cl. 252-62.540.
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Matsuo, Kenji; Nonaka, Tadashi; and Tsuchiya, Ikuo, 5,063,433, Cl. 357-71.000.
Nordica S.p.A.: *See*—
Gorza, Roberto, 5,062,225, Cl. 36-117.000.
Sartor, Mariano; and Gorza, Roberto, 5,062,226, Cl. 36-117.000.
Tacchetto, Maurizio, 5,062,224, Cl. 36-117.000.
Nordictrack, Inc.: *See*—
Engel, Timothy S.; and Iverson, Robert A., 5,062,633, Cl. 272-132.000.
Nordisk Gentofte A/S: *See*—
Jacobs, Howard S., 5,063,204, Cl. 514-8.000.
Nordquist, Michael H.: *See*—
Jay, Eric C.; and Nordquist, Michael H., 5,062,677, Cl. 297-444.000.
Norman, John A. T.: *See*—
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North American Philips Corporation: *See*—
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North American Philips Corp., Signetics Division: *See*—
Broadbent, Eliot K., 5,063,175, Cl. 437-192.000.
North Carolina State University: *See*—
Shih, Jason C. H.; and Williams, C. Michael, 5,063,161, Cl. 435-252.500.
Northern Telecom Limited: *See*—
Sasaki, Lawrence H.; and Chan, Sun-Shiu D., 5,063,579, Cl. 377-48.000.
Northrop Corporation: *See*—
Tully, John W.; O'Brien, Benedict B.; Hant, William; and Hu, King L., 5,063,427, Cl. 357-35.000.
Norton Company: *See*—
Chen, Sy-Hwa; and Sung, Chien-Min, 5,062,865, Cl. 51-295.000.
Norwood, Donald D. Hybrid information management system for handwriting and text. 5,063,600, Cl. 382-13.000.
Nosan, Francis J.: *See*—
Candland, Calvin T.; Christianson, Kim L.; Kennedy, James L.; Smith, David A.; Nosan, Francis J.; and Overend, Steven F., 5,062,366, Cl. 102-430.000.
Nostwick, Allan A., to North American Philips Corporation. High frequency oscillator-inverter circuit for discharge lamps. 5,063,331, Cl. 315-219.000.
Notetry Limited: *See*—
Dyson, James, 5,062,870, Cl. 55-213.000.
Nothofer, Michael: *See*—
Wieland, Dietrich; Kalb, Martin; Grupp, Werner; and Nothofer, Michael, 5,062,743, Cl. 408-6.000.
Nova Pharmaceutical Corporation: *See*—
Abreu, Mary E.; Rzeszotarski, Waclaw; Kyle, Donald J.; Hiner, Roger N.; and Elliott, Richard L., 5,063,245, Cl. 514-404.000.
Novak, Philip F.; Shannon, Robert D.; Pinckney, Robert L.; and Humphreys, James R., Jr., to Boeing Company, The. Aircraft construction. 5,063,384, Cl. 342-1.000.
Nozaki, Yoshihisa; Inden, Takashi; and Takemura, Tohur, to Brother Kogyo Kabushiki Kaisha. Course changing device for conveyer system. 5,062,524, Cl. 198-465.400.
Nudelman, Dennis L.: *See*—
Davis, Ray E.; Duncan, Dana L.; Habboosh, Samir W.; Hall, James R.; Nudelman, Dennis L.; and Westkamper, Michael J., 5,062,299, Cl. 73-609.000.
Nuita, Akira; and Kawaguchi, Katsuhiko, to Tokyo Electric Co., Ltd. Thermal printer having a platen which can be pressed against a thermal head. 5,063,395, Cl. 346-76.0PH.
Numai, Kazuhisa: *See*—
Nakamura, Kosei; and Numai, Kazuhisa, 5,062,744, Cl. 408-8.000.
Nuttin, Pierre L. V.: *See*—
Martin, Martial G. E.; and Nuttin, Pierre L. V., 5,062,597, Cl. 270-39.000.
NYNEX Corporation: *See*—
Vancraeynest, Jan P., 5,063,571, Cl. 375-1.000.
Oberkersch, Angelika; Pirmann, Anton; and Schausberger, Helmut, to Agfa-Gevaert AG. Wet treatment arrangement for photographic sheet carriers. 5,063,401, Cl. 354-320.000.
O'Brien, Benedict B.: *See*—
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O'Brien, Steven M.: *See*—
Davidowski, Dennis J.; Saunders, Michael J.; and O'Brien, Steven M., 5,063,494, Cl. 395-800.000.
OCG Microelectronic Materials, Inc.: *See*—
Salamy, Thomas E., 5,063,138, Cl. 430-326.000.
Ochs, Charles S., to Anchor Hocking Packaging Company. Package with pressure venting closure accepting different types of insert disks for different food products. 5,062,538, Cl. 215-260.000.
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McDermott, Wayne T.; Ockovic, Richard C.; Wu, Jin J.; Cooper, Douglas W.; Schwarz, Alexander; and Wolfe, Henry L., 5,062,898, Cl. 134-7.000.
O'Connor, James D.: *See*—
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ODSK Company, Limited: *See*—
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Ogasawara, Kazui, to Amada Company, Limited. Shearing machine. 5,062,333, Cl. 83-94.000.
Ogata, Hisashi, to Nissan Motor Company, Limited. System for controlling spring coefficient of engine mount. 5,062,497, Cl. 180-300.000.
Ogawa, Ichitaro: *See*—
Tsuyoshi, Hagio; Kobayashi, Kazuo; Yoshida, Hisayoshi; Ogawa, Ichitaro; Harada, Hiroshi; Yasunaga, Hiroaki; and Nishikawa, Hiroshi, 5,063,184, Cl. 501-96.000.
Ogawa, Masaharu: *See*—
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Ogawa, Yoichiro: *See*—
Komoto, Teruo; Okawa, Junji; Ogawa, Yoichiro; Sato, Susumu; Taido, Naokata; and Kuraishi, Tadayuki, 5,063,222, Cl. 514-180.000.
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Oh, Seik; and McKinney, Ray, Jr., to Edward Weck Incorporated. Penetrating plastic ligating clip. 5,062,846, Cl. 606-158.000.
Oh, Young S.: *See*—
Baeck, Andre C.; Busch, Alfred; and Oh, Young S., 5,062,972, Cl. 252-8.800.
Ohashi, Takayoshi, to Kabushiki Kaisha Toshiba. Single-error detecting and correcting system. 5,063,565, Cl. 371-40.200.
Ohbayashi, Gentaro: *See*—
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Ohmura, Hiroshi: *See*—
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Ohno, Akira; Muraoka, Kunihiko; and Nakazato, Wataru, to Japan Aviation Electronics Industry, Limited; and Fuji Jukogyo Kabushiki Kaisha. Electric connector. 5,062,806, Cl. 439-490.000.
Ohno, Shoji: *See*—
Horiuchi, Tadasu; Nishijima, Hideo; and Ohno, Shoji, 5,063,456, Cl. 358-310.000.
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Ohsato, Kiyoshi: *See*—
Miyoshi, Hiroshi; Kamatani, Yoshiteru; Ozue, Tadashi; Narahara, Tatsuya; and Ohsato, Kiyoshi, 5,063,555, Cl. 369-97.000.
Ohshima, Yohichi, to Kabushiki Kaisha Toshiba. Semiconductor device having a two-layer gate structure. 5,063,431, Cl. 357-54.000.
Ohsuga, Masaru; and Takahashi, Kaoru, to Yamaha Hatsudoki Katushiki Kaisha. Separator for fuel cell. 5,063,123, Cl. 429-38.000.
Ohsumi, Yasuhisa, to Alps Electric Co., Ltd. Construction for mounting a cap to a magnetic type rotary encoder. 5,063,382, Cl. 341-15.000.
Ohta, Kazuchika: *See*—
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Owashi, Hitoaki; Ohtsubo, Hiroyasu; Sekiya, Masataka; Minabe, Kohji; Nishijima, Hideo; Masuda, Michio; and Rokuda, Morito, 5,063,437, Cl. 358-22.000.
Ohtsubo, Toshiro; Tsuda, Shigenori; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, to Sumitomo Chemical Co., Ltd. Microencapsulated cockroach-controlling composition. 5,063,059, Cl. 424-408.000.
Ohtsuka, Hiroshi, to Hapyo Yugen Kaisha. Hair comb with absorbant pad. 5,062,435, Cl. 132-108.000.
Oka, Mitsuko; and Okumura, Yoshiharu, to Toray Industries, Inc. Protective sheets having self-adhesive property used for wearing on clothes and keeping them clean. 5,062,158, Cl. 2-46.000.
Oka, Tateki; and Yokoyama, Tomoaki, to Minolta Camera Kabushiki Kaisha. Method for forming multi-color images. 5,063,127, Cl. 430-45.000.
Okada, Kenichi; Nishino, Masashi; and Tanigawa, Shu, to Japan Aviation Electronics Industry Limited. Linear phase ramp fiber optic gyro. 5,062,710, Cl. 356-350.000.
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, to Hitachi, Ltd. Ceramic superconductor article. 5,063,200, Cl. 505-1.000.
Okajima, Masayuki; and Shibuya, Toru, to NEC Corporation. Codec system encoding and decoding an image signal at a high speed. 5,063,443, Cl. 358-133.000.
Okamoto, Satoru; Terazi, Kazufumi; Nishino, Seiichi; and Bonkohara, Manabu, to Sumitomo Electric Industries, Ltd.; and NEC Corporation. Semiconductor device. 5,063,435, Cl. 357-74.000.
Okamoto, Tsukasa; and Ohta, Shuji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Hydraulic power steering apparatus for industrial vehicle. 5,062,494, Cl. 180-132.000.
Okamoto, Yukio, to Hitachi, Ltd. Microwave plasma source apparatus. 5,063,329, Cl. 315-111.210.
Okawa, Junji: *See*—
Komoto, Teruo; Okawa, Junji; Ogawa, Yoichiro; Sato, Susumu; Taido, Naokata; and Kuraishi, Tadayuki, 5,063,222, Cl. 514-180.000.
Okayama, Akira: *See*—
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, 5,063,200, Cl. 505-1.000.
Okazaki, Kiyoshi, to Kabushiki Kaisha Toshiba. Shock wave generating apparatus forming wide concretion-disintegrating region by focused shock wave. 5,062,412, Cl. 128-24.0EL.
Oki Electric Industry Co., Ltd.: *See*—
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Oku, Hidehisa: *See*—
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Okubo, Hirotsugu: *See*—
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Okuda, Eiji; and Nemoto, Hiroyuki, to Nippon Sheet Glass Co., Ltd. Flat plate optical element and method for preparing the same. 5,062,688, Cl. 359-619.000.
Okuda, Masayuki: *See*—
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Okui, Makoto: *See*—
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Okumura, Yoshiharu: *See*—
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Okuyama, Kousuke, to Hitachi, Ltd. Semiconductor integrated circuit device and a method of producing the same. 5,063,170, Cl. 437-41.000.
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Holmes, Paul E., 5,063,160, Cl. 435-253.300.
Oliphant, Sameul C.; and Gormley, David E., to Samuel C. Oliphant. Air conditioning device. 5,062,281, Cl. 62-457.100.
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Onderka, Oswald; and Krasser, Fritz, to Ellenberger & Poensgen GmbH. Safety lock for the doors of electrical applicances. 5,062,668, Cl. 292-25.000.
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Ono, Hideyuki: *See*—
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Ono, Mikio: *See*—
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Orazi, William. Bathroom cabinet. 5,063,283, Cl. 219-218.000.

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Orii, Akira; and Watanabe, Haruhisa, to Janome Sewing Machine Co. Ltd. Stepping motor driving device. 5,063,339, Cl. 318-696.000.

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Orth, Jeffrey L., to Rocky Mountain Research, Inc. Roller pump in an extracorporeal support system. 5,062,775, Cl. 417-477.000.

Ortner, Herbert; and Pfalzer, Lothar, to J. M. Voith GmbH. Process for control of a flotation system. 5,062,964, Cl. 210-740.000.

Ortolano, Ralph J. Connector for turbine element. 5,062,769, Cl. 416-217.000.

Osaka Gas Limited: *See—*
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Ossid Corporation: *See—*
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Ostrand, James C., to General Motors Corporation. Motor vehicle heating, ventilating and air conditioning system with combined mode/temperature door. 5,062,352, Cl. 98-2.080.

Ostrand, James C.; and Drayer, William L., to General Motors Corporation. Motor vehicle passenger compartment heating, ventilating and air conditioning system. 5,062,473, Cl. 165-42.000.

Otis Elevator Company: *See—*
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Otsuka, Shoichi: *See—*
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Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-Kommanditgesellschaft: *See—*
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Hill, James A.; and Burtch, John E., 5,062,568, Cl. 229-1.50B.

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Tristani-Kendra, Miguel G.; and Papapolymerou, George, 5,062,691, Cl. 359-56.000.

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Conrad, Daniel J.; Davenport, Jerry W.; Isen, Robert R.; Bullock, Michael A.; and Riddell, Wilfred E., 5,062,716, Cl. 383-9.000.

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Cooke, Horise M.; and Deiss, Richard F., 5,062,456, Cl. 138-125.000.
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Greiwe, Hansdieter, 5,062,355, Cl. 99-349.000.

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Nalowaniec, Krzysztof; and Simmler, Kurt, 5,062,838, Cl. 604-366.000.

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PCC Airfoils, Inc.: *See—*
Monte, Louis H.; Jeyarajan, Arunachalam; and Graham, Lawrence D., 5,062,468, Cl. 164-122.200.
Monte, Louis H.; Jeyarajan, Arunachalam; and Graham, Lawrence D., 5,062,469, Cl. 164-122.200.

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Pennsylvania Crusher Corporation: *See—*
Barnabie, Edward J.; and Duke, John D., Jr., 5,062,575, Cl. 241-73.000.
Graf, Carl R., 5,062,601, Cl. 241-79.300.

Pentel Kabushiki Kaisha: *See*—
Miyashita, Hiroshi; Hamamoto, Hideotoshi; Nagai, Shigeru; Yamaguchi, Makoto; Isao, Onuki; Takahashi, Hiroshi; and Ishiguro, Atsushi, 5,062,890, Cl. 106-27.000.

Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; and Nishi, Hisami, to Nippon Sheet Glass Co., Ltd. Image correlation calculation apparatus. 5,063,602, Cl. 382-32.000.

Perler, Robert F. Non-reusable disposable syringe and locking device. 5,062,833, Cl. 604-110.000.

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Beratan, David N.; and Perry, Joseph W., 5,062,693, Cl. 359-241.000.

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Fabry, Ehrenfried; Goddard, Georg; Meyer, Dieter; Petermann, Hans; Pirkl, Bernhard; and Wiedemann, Werner, 5,063,379, Cl. 340-784.000.

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Petersen, Kurt E.; Barth, Philip W.; Bryzek, Janusz; and Mallon, Joseph R., Jr., to Schlumberger Industries, Inc. Laminated semiconductor sensor with overpressure protection. 5,062,302, Cl. 73-754.000.

Peterson, Gary L.: *See*—
Botez, Dan; Mawst, Luke J.; and Peterson, Gary L., 5,063,570, Cl. 372-50.000.

Peterson, Miles, to Diesel Kiki Co. Ltd. Vertically collapsible wall partitions. 5,062,464, Cl. 160-193.000.

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Grynaeus, Peter S.; Hollingsworth, Anthony; and Petkiewicz, Chester J., 5,063,101, Cl. 428-172.000.

Petrachkoff, Peter, to Fordees Manufacturing. Two speed hoist drive assembly. 5,062,613, Cl. 266-44.000.

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Gustafsson, Carl-Erik; and Pettersson, Bo, 5,062,214, Cl. 33-706.000.

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Haug, Edward W., 5,062,742, Cl. 407-28.000.

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Noble, Philip C.; and Padgett, Mary B., 5,062,854, Cl. 623-23.000.

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Cooper, Kelvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, 5,063,237, Cl. 514-338.000.

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Pryor, Raymond J.; Pharoah, James F.; and Duirs, Graham F., 5,062,829, Cl. 604-57.000.

Phelleps, Fred R.: *See*—
Geller, Bernard D.; Tyler, Johann U.; Holdeman, Louis B.; Phelleps, Fred R.; and Laird, George F., III, 5,063,177, Cl. 437-209.000.

Phelps, Richard A.; and Lorence, Brian S., to Chivas Products Limited. Visor mount. 5,062,608, Cl. 248-289.100.

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Drake, Charles A., 5,063,191, Cl. 502-174.000.

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Smith, Lowell S.; and Piel, Edward J., Jr., 5,062,429, Cl. 128-661.010.

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Pier, William J.: *See*—
Goins, James V.; Duggan, Robert B.; Pier, William J.; and Wienhoft, Roger, 5,062,354, Cl. 98-62.000.

Pierce, Gerald A.: *See*—
Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; and Nishi, Hisami, 5,063,602, Cl. 382-32.000.

Pierce, John R.: *See*—
Lindert, Andreas; Pierce, John R.; and McCormick, David R., 5,063,089, Cl. 427-354.000.

Pierce, Zona R.; Tyagi, Dinesh; and Wilson, John C., to Eastman Kodak Company. Xerographic phototypesetting system and toner useful therein. 5,063,132, Cl. 430-109.000.

Pike, David W.: *See*—
Legare, Pierre; and Pike, David W., 5,062,874, Cl. 55-337.000.

Pinckney, Robert L.: *See*—
Novak, Philip F.; Shannon, Robert D.; Pinckney, Robert L.; and Humphreys, James R., Jr., 5,063,384, Cl. 342-1.000.

Pioneer Electronic Corporation: *See*—
Chikuma, Kiyofumi, 5,063,556, Cl. 369-112.000.
Igarashi, Ken, 5,063,474, Cl. 361-220.000.
Watari, Haruo; and Yasuda, Sigeru, 5,063,550, Cl. 369-44.360.
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,063,551, Cl. 369-48.000.

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Pirkl, Bernhard: *See*—
Fabry, Ehrenfried; Goddard, Georg; Meyer, Dieter; Petermann, Hans; Pirkl, Bernhard; and Wiedemann, Werner, 5,063,379, Cl. 340-784.000.

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Oberkersch, Angelika; Pirmann, Anton; and Schausberger, Helmut, 5,063,401, Cl. 354-320.000.

Pirovano, Camillo. Cable with radial elements for conveying materials behaving as fluids through ducts. 5,062,741, Cl. 406-76.000.

Pitney Bowes Inc.: *See*—
Holbrook, Russell W.; and MacDonald, Scott A., 5,062,600, Cl. 271-35.000.

Piznik, Sylvia: *See*—
Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; and Wieck, Henry J., 5,063,081, Cl. 427-2.000.

Plains Cotton Cooperative Association: *See*—
Lindsey, James D.; Hutton, Charles D.; Tubb, Joe W.; Shipman, Carol L.; and Kyle, Albert S., III, 5,063,507, Cl. 364-408.000.

Plath, Peter; Eicken, Karl; Goetz, Norbert; Wild, Jochen; Meyer, Norbert; and Wuerzer, Bruno, to BASF Aktiengesellschaft. N-substituted 3,4,5,6-tetrahydrophthalimides and their intermediates. 5,062,884, Cl. 71-95.000.

Platter, Helmuth; and Webhofer, Artur, to Leitner, S.p.A. Tracked vehicle and in particular one for the preparation of ski slopes. 5,062,493, Cl. 180-9.520.

Pneumafil Corporation: *See*—
Williams, Roger D., 5,062,872, Cl. 55-302.000.

Pockrandt, Frank J. Chemical composition, and methods of constructing and utilizing same. 5,062,895, Cl. 106-36.000.

Poenitzsch, Werner: *See*—
Roth, Siegfried; Benz, Detlef; Reichle, Anton; Teske, Reiner; Zimmermann, Peter; Hager, Peter; Mueller, Josef; and Poenitzsch, Werner, 5,062,589, Cl. 244-117.00R.

Pohlmann, Peter: *See*—
Schaberg, Frank; Martens, Heribert; and Pohlmann, Peter, 5,062,615, Cl. 266-217.000.

Poillon, Nannette; Canistraro, Howard; and Sienko, Ronald F., to Nannette Poillon. Projectile trajectory determination system. 5,062,641, Cl. 273-181.00C.

Polaroid Corporation: *See*—
Beyea, Dana M.; and Meehan, Kathleen, 5,063,174, Cl. 437-184.000.

Pollitt, Richard F.: *See*—
Jasinski, Joseph E.; Lingle, Charles H.; Pollitt, Richard F.; and Shuman, David W., 5,063,289, Cl. 250-221.000.

Porter, Frank K., Jr.: *See*—
DiPrima, James J.; and Porter, Frank K., Jr., 5,062,590, Cl. 244-118.500.

Potier, Michel; and Briet, Gilles, to Hutchinson, S.A.; and Valeo Thermique Moteur, S.A. Snap-fastening assembly device for motor vehicle heat exchangers. 5,062,478, Cl. 165-178.000.

Potter, Frank. Side-sliding storage rack for 3480 cartridges. 5,062,535, Cl. 211-162.000.

Potter, William R., to Health Research, Inc. In vivo fluorescence photometer. 5,062,431, Cl. 128-665.000.

Potts, Jack M.: *See*—
Weatherby, John H.; and Potts, Jack M., 5,062,415, Cl. 128-76.00R.

Pourailly, Jean-Louis: *See*—
Coppier, Herve ; Pourailly, Jean-Louis; and Roger, Joseph, 5,063,363, Cl. 333-33.000.

PPG Industries, Inc.: *See*—
Jensen, Thomas H., 5,062,876, Cl. 65-1.000.
Mackey, Donald A., 5,062,621, Cl. 269-305.000.

Praxl, Hubert: *See*—
Rohleder, Norbert; Praxl, Hubert; and Gobel-Rick, Dietrich, 5,062,458, Cl. 141-80.000.

Preibsch, Wolfgang: *See*—
Weber, Frank; and Preibsch, Wolfgang, 5,062,978, Cl. 252-49.300.

Preobrazhensky, Oleg A.: *See*—
Aleshin, Nikolai P.; Baranov, Vladimir J.; Dolgov, Vyacheslav M.; Yarovoi, Alexandr A.; and Preobrazhensky, Oleg A., 5,062,301, Cl. 73-629.000.

Presstek, Inc.: *See*—
Lewis, Thomas E.; Williams, Richard A.; Gardiner, John P.; and Kline, John F., 5,062,364, Cl. 101-467.000.

Price, Barry L.; and Thornhill, Christopher J., to British Gas plc. Monitor system. 5,063,527, Cl. 364-550.000.

Prince, Anthony P., to Outboard Marine Corporation. Single lever control. 5,062,516, Cl. 192-0.096.

Pritchard, Jeffrey A., to Eastman Kodak Company. Method and apparatus for preventing aliasing in an electronic still camera. 5,063,450, Cl. 358-213.280.

Procter & Gamble Co., The: *See—*
Baeck, Andre C.; Busch, Alfred; and Oh, Young S., 5,062,972, Cl. 252-8.800.
Coffindaffer, Timothy W.; Bartolo, Robert G.; and Belfiore, Kathleen A., 5,062,971, Cl. 252-8.600.
Lavash, Bruce W., 5,062,392, Cl. 119-167.000.

Product Development (S.G.Z.) Ltd: *See—*
Gross, Joseph; and Zucker, Shlomo, 5,062,834, Cl. 604-143.000.

Proform Fitness Products, Inc.: *See—*
Bingham, Curt G., 5,062,627, Cl. 272-70.000.
Dalebout, William T.; and Jensen, Jon, 5,062,626, Cl. 272-69.000.
Dalebout, William T.; and Burk, Michael, 5,062,632, Cl. 272-129.000.

Prokopius, Josef P. Multifunction gearing mechanism. 5,062,824, Cl. 475-342.000.

Pryor, Raymond J.; Pharoah, James F.; and Duirs, Graham F., to Carter Holt Harvey Plastic Products Group Limited. Relates to devices for administering a substance such as a drug or chemical or the like. 5,062,829, Cl. 604-57.000.

Pulliainen, Martti; Savisalo, Hannu; and Ainali, Markku, to Savcor-Consulting Oy. Procedure and means for separating plastic particles electrically from solutions, in particular from cellulose and paper fibre solutions. 5,062,932, Cl. 204-130.000.

Pundra Indostries Limited: *See—*
Westwinkel, Florian, 5,062,678, Cl. 312-221.000.

Purina Mills, Inc.: *See—*
Binder, Stephen F.; and Lanter, Kent J., 5,063,067, Cl. 426-69.000.

Purnell, Charles G.; and Baker, Andrew R., to Brico Engineering Limited. Valve guide. 5,062,908, Cl. 148-332.000.

Putnam, Brett J.: *See—*
Harris, Robert D.; and Putnam, Brett J., 5,062,219, Cl. 34-133.000.

QIT-Fer et Titane, Inc.: *See—*
Gueguin, Michel, 5,063,032, Cl. 423-84.000.

Quantum Group, Inc.: *See—*
Goldstein, Mark K., 5,063,164, Cl. 436-169.000.

Quanz, Gerhard: *See—*
Mutze, Ulrich; Quanz, Gerhard; Vuong, The A.; and Kiesewetter, Wolfgang, 5,063,460, Cl. 358-474.000.

Quignon, Jean: *See—*
Ferre, Alain; Chevance, Christophe; and Quignon, Jean, 5,063,524, Cl. 364-516.000.

R. J. Braverman Corp.: *See—*
Braverman, Robert J.; and Shklyarov, Isaak M., 5,062,230, Cl. 42-1.090.
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R. T. Vanderbilt Company, Inc.: *See—*
Karol, Thomas J., 5,062,863, Cl. 44-341.000.

Ra, Jong Oh; and Lim, Joon Young. Continuously variable transmission with controlling brakes. 5,062,823, Cl. 475-330.000.

Raatz, Francis: *See—*
Dufresne, Pierre; and Raatz, Francis, 5,062,946, Cl. 208-115.000.

Rabhi, Lounes: *See—*
Davison, Ellard D., Jr.; and Rabhi, Lounes, 5,062,447, Cl. 137-493.000.

Racal Data Communications Inc.: *See—*
Sackman, Edward J.; and Wray, Donald L., 5,063,303, Cl. 307-296.100.
Vrenjak, Milan J., 5,063,523, Cl. 364-514.000.

Raczykowski, Daniel G.: *See—*
Siria, Darrell L.; Sommerfeld, Lorran; and Raczykowski, Daniel G., 5,062,487, Cl. 169-91.000.

Rader, Robert R.: *See—*
Wirtz, John W.; Yanik, David; Rader, Robert R.; Mendoza, Roel; and Essig, Dennis E., 5,062,762, Cl. 414-786.000.

Radiological & Chemical Technology, Inc.: *See—*
Asay, Roger H., 5,062,291, Cl. 73-3.000.

Radke, Garold E.: *See—*
Adamic, Raymond J.; Wickramanayake, Palitha; Hindagolla, Suraj L.; Radke, Garold E.; and Halko, David J., 5,062,893, Cl. 106-22.000.

Raff, Friedrich: *See—*
Maier, Ulrich; and Raff, Friedrich, 5,062,314, Cl. 74-475.000.

Ragland, Frank R., Jr., to Thomson Consumer Electronics Inc. Color picture tube having improved shadow mask-frame assembly support. 5,063,325, Cl. 313-405.000.

Rahn, Peter R. Thread protector and tip maintenance device for a billiard cue. 5,062,636, Cl. 273-68.000.

Rainin Instrument Co., Inc.: *See—*
Magnussen, Haakon T., Jr., 5,062,706, Cl. 356-246.000.

Rais, Elliot. Use indicator for a disposable razor. 5,062,209, Cl. 30-41.700.

Raja, Kishor B.: *See—*
Peters, Timothy J.; and Raja, Kishor B., 5,063,205, Cl. 514-12.000.

Rallapalli, Krishna, to Raytheon Company. Ferroelectric memory with diode isolation. 5,063,539, Cl. 365-145.000.

Ramanan, V. R. V.; and Smith, Carl H., to Allied-Signal Inc. Iron rich metallic glasses having saturation induction and superior soft ferromagnetic properties at high magnetization rates. 5,062,909, Cl. 148-304.000.

Rambacher, John S.: *See—*
Majerus, Norbert; and Rambacher, John S., 5,062,783, Cl. 425-115.000.

Rampolla, Donald S.; and Speer, Elmer, to United States of America, Energy. Quick-sealing design for radiological containment. 5,062,186, Cl. 24-389.000.

Ramsbro, Borje K. H., to System 3R USA, Inc. Vise. 5,063,013, Cl. 269-136.000.

Ranco Incorporated of Delaware: *See—*
Gillett, Jimmie D., 5,063,372, Cl. 340-547.000.

Randleman, Randy J.: *See—*
Chanter, Edward G.; and Randleman, Randy J., 5,062,647, Cl. 273-442.000.

Rank Taylor Hobson Limited: *See—*
Buehring, Ian K., 5,063,291, Cl. 250-231.160.

Rankin, Russel J.; de Chastel, David J., deceased (by de Chastel, Ann, executrix); Wescombe, Graeme L.; Kerr, David T.; Boyce, Phillip R.; White, Raymond M.; Tritchler, Robert W.; and Buhot, John W., to Commonwealth Scientific & Industrial Research Organisation; and Australian Meat & Live-Stock Research & Development Corp. Automatic animal processing. 5,062,820, Cl. 452-187.000.

Rao, A. Srinivasa; and Arora, Om P., to United States of America, Navy. Method to produce $YBa_2Cu_3O_{6+x}$ superconducting wires or tapes. 5,063,201, Cl. 505-1.000.

Rashleigh, Scott C.: *See—*
Barrow, Ross; Elias, Martin C.; Lyons, Peter R. A.; Jacob, Peter G.; and Rashleigh, Scott C., 5,062,686, Cl. 385-33.000.

Rasmussen, Paul C., to General Electric Company. Electrical coil connector for dynamoelectric machine windings. 5,063,315, Cl. 310-71.000.

Rassieur, Charles L., to Central Mine Equipment. Kelly bar coupling. 5,062,490, Cl. 173-104.000.

Ratcliff, Keith: *See—*
Green, David T.; Young, Wayne P.; Bolanos, Henry; Geiste, Robert J.; Ratcliff, Keith; and Alesi, Daniel E., 5,062,563, Cl. 227-176.000.

Raychem Corporation: *See—*
—Tomita, Akira; Diaz, Stephen H.; Dubrow, Robert S.; and Feldman, Michael, 5,062,254, Cl. 53-467.000.

Rayco Enterprises, Inc.: *See—*
Arno, Raymond P.; and Carnes, Scott C., 5,062,571, Cl. 236-43.00A.

Raytheon Company: *See—*
DiPrima, James J.; and Porter, Frank K., Jr., 5,062,590, Cl. 244-118.500.
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Smith, Irl W.; and Schindler, Manfred J., 5,063,361, Cl. 332-103.000.

Reed, Victoria K. Riding capsule device. 5,062,624, Cl. 272-1.00R.

Rees, David C.: *See—*
Horwell, David C.; and Rees, David C., 5,063,242, Cl. 514-414.000.

Refurbished Turbine Components Limited: *See—*
Fraser, Michael J., 5,062,205, Cl. 29-889.700.

Rehm, Thomas: *See—*
Baechtel, Donald F.; Svarovsky, James E.; and Rehm, Thomas, 5,063,335, Cl. 318-609.000.

Reich, Richard: *See—*
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, 5,062,288, Cl. 72-383.000.

Reichel, Klaus T., to Man Roland Druckmaschinen AG. Flexible printing plate attachment system. 5,062,363, Cl. 101-415.100.

Reichelt, Helmut: *See—*
Hahn, Erwin; Hansen, Guenter; Etzbach, Karl-Heinz; Reichelt, Helmut; Schefczik, Ernst; Degen, Helmut; Krallmann, Reinhold; and Wagenblast, Gerhard, 5,062,861, Cl. 8-639.000.

Reichle, Anton: *See—*
Roth, Siegfried; Benz, Detlef; Reichle, Anton; Teske, Reiner; Zimmermann, Peter; Hager, Peter; Mueller, Josef; and Poenitzsch, Werner, 5,062,589, Cl. 244-117.00R.

Reichle, Heinz: *See—*
Bauer, Bernhard; Reichle, Heinz; and Stolz, Robert, 5,062,719, Cl. 384-450.000.

Reiling, Victor G.; and Dean, Bryan L., to Nasta International, Inc. Portable drum sound simulator generating multiple sounds. 5,062,341, Cl. 84-702.000.

Reinecke, Paul: *See—*
Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 5,063,241, Cl. 514-383.000.

Reischel, Joseph G.: *See—*
Burns, James A.; and Reischel, Joseph G., 5,062,421, Cl. 128-205.270.

Reiter, Roger; Boyko, Stanley; and Boyko, Nadina, to F. P. Bourgault Industries. Spray shield. 5,062,572, Cl. 239-899.000.

Reits, Bernard J., to Hollandse Signaalapparaten B.V. Antenna system with adjustable beam width and beam orientation. 5,063,389, Cl. 342-359.000.

Repine, Joseph T.: *See—*
Doherty, Annette M.; Hamilton, Harriet W.; Hodges, John C.; Repine, Joseph T.; and Sircar, Ila, 5,063,207, Cl. 514-18.000.

Repperger, Daniel W., to United States of America, Air Force. Flight control system with tactile feedback. 5,062,594, Cl. 244-175.000.

Research Foundation of the State University of New York, The: *See—*
Eisch, John J.; and Boleslawski, Marek P., 5,063,083, Cl. 427-53.100.

Revel, Michel; and Chebath, Judith, to Yeda Research and Development Co., Ltd. Interferon-induced (2′–5′) oligo a synthetase gene,

mRNA, cDNA and enzymes having (2'–5') oligo a synthetase activity. 5,063,159, Cl. 435-252.300.

Revlon, Inc.: *See*—
Verdon, Debra; Tietjen, Marlene; and Brown, Ivonne, 5,063,050, Cl. 424-63.000.

Rexnord Corporation: *See*—
Hall, David A.; and Marjancik, John R., 5,062,720, Cl. 384-484.000.

Reynolds, Brett S.: *See*—
Crandall, John H.; Davis, Stephen J.; and Reynolds, Brett S., 5,063,564, Cl. 370-110.100.

Reynolds, George, to Taylor, Ronald F. Outboard motor. 5,062,814, Cl. 440-31.000.

Rhein, Thomas: *See*—
Gross, Heinz; Fischer, Jens-Dieter; Siol, Werner; Sufke, Thomas; and Rhein, Thomas, 5,063,112, Cl. 428-412.000.

Rhoden, Buddy; and Singletary, John. ATV guard apparatus. 5,062,675, Cl. 296-1.100.

Rhodes, Alex: *See*—
Roberts, Simon; Battista, John A.; and Rhodes, Alex, 5,062,323, Cl. 81-15.700.

Rhone-Poulenc Rorer Pharmaceuticals Inc.: *See*—
Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., 5,063,230, Cl. 514-213.000.

Rice, Donald D.: *See*—
Woollums, David E.; and Rice, Donald D., 5,062,449, Cl. 137-505.460.

Rich, Arthur; and Van House, James C., to University of Michigan, The. Positron microscopy. 5,063,293, Cl. 250-308.000.

Rich Products Corporation: *See*—
Kahn, Marvin L.; and O'Mahony, John S., 5,063,074, Cl. 426-585.000.

Richardson, Kenneth: *See*—
Cooper, Kelvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, 5,063,237, Cl. 514-338.000.

Ricoh Company, Ltd.: *See*—
Itabashi, Akihisa, 5,062,679, Cl. 359-206.000.
Kaneko, Yutaka, 5,063,286, Cl. 250-208.100.
Koshiishi, Takaho, 5,063,590, Cl. 379-99.000.
Nakajima, Tomohiro, 5,063,409, Cl. 355-200.000.
Shigemori, Toshihiro, 5,063,552, Cl. 369-50.000.
Shirasugi, Kouji, 5,063,414, Cl. 355-296.000.

Riddell, Wilfred E.: *See*—
Conrad, Daniel J.; Davenport, Jerry W.; Isen, Robert R.; Bullock, Michael A.; and Riddell, Wilfred E., 5,062,716, Cl. 383-9.000.

Rider, Donald L. Nebulizer with valved "T" assembly. 5,062,419, Cl. 128-200.210.

Rieder, Daniel: *See*—
Lauper, Alfred; Kupper, Hanspeter; and Rieder, Daniel, 5,063,354, Cl. 328-14.000.

Rieter Machine Works Limited: *See*—
Mondini, Gian-Carlo; and Ackeret, Walter, 5,062,183, Cl. 19-225.000.

Rikker, Leslie D. Method and apparatus for treating gaseous material from evaporative pattern casting. 5,062,470, Cl. 164-457.000.

Rincoe, Richard G. Artifical limb with movement controlled by reversing electromagnet polarity. 5,062,855, Cl. 623-24.000.

Rising, Donald B.; and Montminy, Emile O., to Millipore Corporation. Filter punch and filter collection system. 5,062,308, Cl. 73-864.410.

Ritter, Robert A. Lined hazardous waste incinerator. 5,062,372, Cl. 110-242.000.

Rivera, James A.: *See*—
Nguyen, Dat; Sansevero, Frank; Johnson, Gerald E.; and Rivera, James A., 5,062,520, Cl. 198-335.000.

Roach, William R., to David Sarnoff Research Center, Inc. Scanned liquid crystal display with select scanner redundancy. 5,063,378, Cl. 340-784.000.

Robert Bosch GmbH: *See*—
Edelhaeuser, Erhard; Schmid, Hans-Dieter; Speckner, Ludwig; Wutz, Karl; and Steffen, Horst, 5,063,366, Cl. 335-271.000.
Fabry, Ehrenfried; Goddard, Georg; Meyer, Dieter; Petermann, Hans; Pirkl, Bernhard; and Wiedemann, Werner, 5,063,379, Cl. 340-784.000.
Kleinhans, Josef, 5,063,352, Cl. 324-706.000.

Roberts, David A.: *See*—
Ellison, Thomas L.; Roberts, David A.; Ivankovits, John C.; and Norman, John A. T., 5,062,902, Cl. 148-23.000.

Roberts, Simon; Battista, John A.; and Rhodes, Alex, to Baseline Products, Inc. Tire repair plug and installation tool. 5,062,323, Cl. 81-15.700.

Robertson, David H. Attachment for crossbow that shoots arrows to enable the crossbow to shoot slugs. 5,062,406, Cl. 124-25.000.

Robertson, Diane M.; and Byalik, Ludmila, to Dexter Corporation, The. Fibrous base web bonding system and method. 5,063,104, Cl. 428-286.000.

Robotic Displays Corporation: *See*—
Smith, Glenn W., 5,063,377, Cl. 340-764.000.

Robrecht, Michael J.: *See*—
Aufderheide, Brian E.; Robrecht, Michael J.; and Kelley, Wayne R., 5,062,916, Cl. 156-269.000.

Roche, Andre , to Vibrachoc. Vibration and shock absorber device. 5,062,507, Cl. 188-378.000.

Rockefeller University, The: *See*—
Kappas, Attallah; and Drummond, George S., 5,063,223, Cl. 514-185.000.

Rocky Mountain Research, Inc.: *See*—
Orth, Jeffrey L., 5,062,775, Cl. 417-477.000.

Rodgers, J. Michael: *See*—
Jewell, Tanya E.; and Rodgers, J. Michael, 5,063,586, Cl. 378-34.000.

Roefs, Sebastianus P. F. M.: *See*—
Muijs, Herman M.; Beers, Nicolaas C. M.; and Roefs, Sebastianus P. F. M., 5,062,970, Cl. 252-8.554.

Roehm, Earl: *See*—
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, 5,062,288, Cl. 72-383.000.

Roemer, Peter B.; Mueller, Otward M.; Park, John N.; and McMurray, William, to General Electric Company. Transformer-coupled gradient speed-up circuit. 5,063,349, Cl. 324-322.000.

Roger, Joseph: *See*—
Coppier, Herve ; Pourailly, Jean-Louis; and Roger, Joseph, 5,063,363, Cl. 333-33.000.

Rogers, Duane E.: *See*—
Breckenfeld, Paul W.; Nettles, James A.; Rogers, Duane E.; and Broughton, George, 5,062,403, Cl. 123-413.000.

Rohleder, Norbert; Praxl, Hubert; and Gobel-Rick, Dietrich, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Annular vessel for receivng radioactive solutions containing solids. 5,062,458, Cl. 141-80.000.

Rohm GmbH Chemische Fabrik: *See*—
Gross, Heinz; Fischer, Jens-Dieter; Siol, Werner; Sufke, Thomas; and Rhein, Thomas, 5,063,112, Cl. 428-412.000.

Rohm and Haas Company: *See*—
Martorano, Richard, 5,063,091, Cl. 427-385.500.
Wanat, Robert A.; and Crabb, Charles C., 5,063,259, Cl. 523-201.000.

Rohr, Franz-Josef, to Asea Brown Boveri Aktiengesellschaft. Fuel cell assembly comprising permanently combined fuel cells. 5,063,122, Cl. 429-32.000.

Rokuda, Morito: *See*—
Owashi, Hitoaki; Ohtsubo, Hiroyasu; Sekiya, Masataka; Minabe, Kohji; Nishijima, Hideo; Masuda, Michio; and Rokuda, Morito, 5,063,437, Cl. 358-22.000.

Roland, Charles M.; and Sonnenschein, Mark F., to United States of America, Navy. Selective metallization of carbonyl-containing polymer films. 5,062,939, Cl. 204-192.170.

Rolfe, Jonathan L.: *See*—
Beaty, John S.; and Rolfe, Jonathan L., 5,062,936, Cl. 204-164.000.

Rolls-Royce plc: *See*—
Marriage, Peter V., 5,062,768, Cl. 416-97.00R.

Rolph, Randy K.: *See*—
Longo, Robert T.; Bardai, Zaher; Manoly, Arthur E.; Forman, Ralph; and Rolph, Randy K., 5,063,323, Cl. 313-309.000.

Roltra, Morse S.p.A.: *See*—
Brusasco, Enzo, 5,062,240, Cl. 49-348.000.

Romano, James J.: *See*—
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,062,167, Cl. 5-61.000.

Rong, Wang C. Automobile steering lock with a rod anti-releasing mechanism. 5,062,282, Cl. 70-209.000.

Roos, Sture G., to Telefonaktiebolaget L M Ericsson. Function unit in which circuit boards are mounted on a center plane by way of distribution boards. 5,062,801, Cl. 439-61.000.

Roovers, Wilhemus M. M.; and de Boer, Jan, to General Electric Company. Polymer mixture which comprises an aromatic polycarbonate and a polyalkylene terephthalate, and articles formed therefrom. 5,062,984, Cl. 525-67.000.

Rosemount Inc.: *See*—
Hagen, Floyd W., 5,062,869, Cl. 55-159.000.

Rosenberg, Neil A. Dental handpiece. 5,062,796, Cl. 433-82.000.

Rosenberg, Saul H.; Spina, Kenneth P.; and Crowley, Steven R., to Abbott Laboratories. Peptidyl aminodiol renin inhibitors. 5,063,208, Cl. 514-19.000.

Rosenfeld, Elieser Z.; and Coleman, Lewis, to Spegas Industries Ltd. Method and apparatus for gas analysis. 5,063,275, Cl. 250-343.000.

Ross, Carl H.; Machat, Rudolf; Haring, Werner; and Lettenbauer, Gustav, to Boehringer Mannheim GmbH. Process for the enrichment and/or isolation of heart glycosides with the use of non-polar absorber resins. 5,062,959, Cl. 210-635.000.

Ross, Jeff E.: *See*—
Pate, Gerry E.; Mullinax, Ronald L.; Sutton, Alexander C.; and Ross, Jeff E., 5,063,505, Cl. 364-400.000.

Ross, Robert V.: *See*—
Lawrence, Peter D.; and Ross, Robert V., 5,062,755, Cl. 414-4.000.

Rossetto, Giorgio: *See*—
Mantovani, Marco; and Rossetto, Giorgio, 5,062,826, Cl. 494-85.000.

Rossi, Alessandro, to Axis USA, Inc. Methods and apparatus for fusing armature and stator wires. 5,063,279, Cl. 219-86.510.

Rossi, Debra J.: *See*—
Kuehn, Christa G.; Rossi, Debra J.; and Isied, Stephan S., 5,063,151, Cl. 435-7.330.

Roth, David S.: *See*—
Aulbach, Paul L.; Frank, Dorothy M.; and Roth, David S., 5,062,434, Cl. 131-336.000.

Roth, Siegfried; Benz, Detlef; Reichle, Anton; Teske, Reiner; Zimmermann, Peter; Hager, Peter; Mueller, Josef; and Poenitzsch, Werner, to Dornier Luftfahrt GmbH. Fiber reinforced pressure bulkhead with integrated frame. 5,062,589, Cl. 244-117.00R.

Roth, William H.: *See*—
Muchmore, Robert A.; and Roth, William H., 5,062,517, Cl. 192-106.200.
Roussel Uclaf: *See*—
Clemence, Francois; Frechet, Daniel; Hamon, Gilles; and Jouquey, Simone, 5,063,225, Cl. 514-211.000.
Roussel Ulcaf: *See*—
Fenske, Dankwart C.; Kuo, Elizabeth A.; and Tully, Wilfred R., 5,063,229, Cl. 514-258.000.
Rouyer, Pascal G.: *See*—
Allais, Jean-Philippe P. B.; Guillermond, Alain R.; and Rouyer, Pascal G., 5,062,347, Cl. 89-37.070.
Rowland, David E., to Rowland, Janice L. Clip for holding elongated devices. 5,062,184, Cl. 24-16.0PB.
Rowland, Janice L.: *See*—
Rowland, David E., 5,062,184, Cl. 24-16.0PB.
Rowley, Andrew T.: *See*—
Linden-Smith, Neil A.; and Rowley, Andrew T., 5,063,333, Cl. 315-326.000.
Royce Medical Company: *See*—
Grim, Tracy E., 5,062,414, Cl. 128-68.100.
RSA Entgrat-Technik Rainer Schmidt: *See*—
Huhmann, Reinhard, 5,062,177, Cl. 15-88.200.
Rubin, Mae K., to Mobil Oil Corp. Crystalline borosilicate. 5,063,037, Cl. 423-277.000.
Ruckes, Andreas; Brock, Martin; and Weider, Richard, to Bayer Aktiengesellschaft. Process for the production of plastics by the polyisocyanate polyaddition process and catalysts suitable for this process. 5,063,252, Cl. 521-108.000.
Rudnick, Alan S.; and Janke, Lance N. Jewelry display device. 5,062,526, Cl. 206-6.100.
Ruff, Klaus, to Huels Aktiengesellschaft. Method for increasing the yield of trichlorosilane in the fluidized-bed hydrochlorination of silicon. 5,063,040, Cl. 423-342.000.
Ruggles, John D.: *See*—
Humble, John D.; Searles, Raymond C.; Ruggles, John D.; and Jacobowitz, Judah L., 5,063,028, Cl. 422-144.000.
Runkel, Kevin D., to Bikestream, Inc. Pressurized potable beverage drinking system. 5,062,591, Cl. 224-148.000.
Russell, Boyd: *See*—
Kisman, Kenneth E.; and Russell, Boyd, 5,062,483, Cl. 166-263.000.
Rutty, Brian R.: *See*—
Hedderick, John B.; Rutty, Brian R.; Page, David G.; and Walshe, John J., 5,062,548, Cl. 222-190.000.
Rutz, Howard; and Hanejko, Francis G., to Hoeganaes Corporation. Doubly-coated iron particles. 5,063,011, Cl. 264-126.000.
Rutze, Uwe: *See*—
Ackermann, Ulrich; Kersten, Ralf T.; Etzkorn, Heinz-Werner; Paquet, Volker; and Rutze, Uwe, 5,062,508, Cl. 118-723.000.
Ryan, Richard P.; Shaffer, Glenn W.; Halstead, Gary A.; Smith, David M.; and Joshi, Shrikant M., to General Motors Corporation. Heat exchanger with an extruded tank. 5,062,476, Cl. 165-173.000.
Ryder, Douglas N.: *See*—
Hamadah, Talal T.; Ryder, Douglas N.; and Friedman, Harvey S., 5,063,476, Cl. 361-384.000.
Rye, Grover W.; Kindry, David A.; and Weber, Carolyn T., to Goodyear Tire & Rubber Company, The. Pneumatic tire made by butt-splicing structural members and a method therefor. 5,062,462, Cl. 152-548.000.
Ryoke, Katsumi; Takahashi, Masatoshi; and Nishikawa, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium in which certain physical properties of the magnetic layer and the backcoat layer are specified. 5,063,105, Cl. 428-336.000.
Rzeszotarski, Waclaw: *See*—
Abreu, Mary E.; Rzeszotarski, Waclaw; Kyle, Donald J.; Hiner, Roger N.; and Elliott, Richard L., 5,063,245, Cl. 514-404.000.
Saada, Serge: *See*—
Leprince, Philippe; Chollet, Patrick; and Saada, Serge, 5,063,330, Cl. 315-111.210.
Saadi, Robert E.; Becker, Allen R.; Ball, Christopher J.; and Steffan, John, to Zurn Industries, Inc. On demand sensor flush valve. 5,062,453, Cl. 137-624.110.
SAB Nordic AB: *See*—
Sjarne, Anders O. G.; and Larsson, Sven-Olof, 5,062,505, Cl. 188-153.00R.
Sabelstrom, Jan: *See*—
Bolin, Goran; Latvakangas, Urpo; and Sabelstrom, Jan, 5,062,754, Cl. 412-4.000.
Sabre Industries, Inc.: *See*—
Glukhov, Michael, 5,062,441, Cl. 137-81.100.
Sackman, Edward J.; and Wray, Donald L., to Racal Data Communications Inc. Soft start circuit. 5,063,303, Cl. 307-296.100.
Safranek, Robert J.: *See*—
Knauer, Scott C.; Netravali, Arun N.; Petajan, Eric D.; Safranek, Robert J.; and Westerink, Peter H., 5,063,444, Cl. 358-133.000.
Sagawa, Takayoshi; Tani, Shichisei; and Kato, Katsuo, to Japan Tobacco Inc. Device for aligning articles having different diameters at their head and tails along a selected direction of movement while concurrently orienting their heads either forwardly or rearwardly relative to that direction. 5,062,522, Cl. 198-400.000.
Saiha, Erik: *See*—
Hyoty, Paavo; and Saiha, Erik, 5,062,921, Cl. 162-31.000.
Saijo, Teruaki: *See*—
Hashimoto, Nobuo; Suzuki, Kunioki; and Saijo, Teruaki, 5,062,297, Cl. 73-597.000.
Saint-Gobain Vitrage: *See*—
Kunert, Heinz, 5,062,248, Cl. 52-208.000.
Saito, Kajin: *See*—
Ozawa, Sinya; Kondo, Katsumi; and Saito, Kajin, 5,062,886, Cl. 75-371.000.
Saitoh, Izumi; and Sasaki, Yoshio, to Shionogi & Co., Ltd.; and Nisshin Chemical Industry Co., Ltd. UV light-absorbing skin-protecting composition. 5,063,048, Cl. 424-59.000.
Saji, Mikio: *See*—
Hoshino, Akira; Saji, Mikio; and Yamaguchi, Isamu, 5,063,256, Cl. 523-102.000.
Sakai, Hiromichi: *See*—
Katsumata, Haruo; Sakai, Hiromichi; Takahashi, Keisuke; Ootaguro, Hirofumi; Matsumoto, Masashi; Nakamura, Moriyasu; and Ando, Tatsuo, 5,062,897, Cl. 106-696.000.
Sakai, Hiroshi; Asai, Masamichi; Hayashi, Kenzo; Sakurai, Kazunori; and Watanabe, Kazuhiko, to Toshiba Ceramics Co., Ltd. Sliding nozzle device. 5,062,554, Cl. 222-600.000.
Sakai, Hitoshi: *See*—
Maeda, Takeshi; Kawaguchi, Hiroshi; Yamaguchi, Harukazu; Sakai, Hitoshi; Ando, Akio; Matsushita, Yasuo; and Takemoto, Tetsuya, 5,062,926, Cl. 202-183.000.
Sakai, Minekazu: *See*—
Fujii, Tetsuo; Sakai, Minekazu; and Kuroyanagi, Akira, 5,063,423, Cl. 357-23.500.
Sakai, Tadamiti: *See*—
Miyao, Hidehiko; Ikeda, Satoshi; Shiotsuki, Masao; Kawamura, Shigeyoshi; Komatsu, Fumiaki; Takagi, Ikuji; and Sakai, Tadamiti, 5,063,001, Cl. 264-0.500.
Sakakibara, Kenji, to Brother Kogyo Kabushiki Kaisha. Apparatus for forming images. 5,063,405, Cl. 355-32.000.
Sakakibara, Shinsuke: *See*—
Inaba, Yoshiharu; Naito, Hideo; Kamiguchi, Masao; Neko, Noriaki; and Sakakibara, Shinsuke, 5,062,784, Cl. 425-143.000.
Sakakibara, Tetsuya: *See*—
Kitagawa, Katsuji; Moriguchi, Kazutomo; Miyake, Tetsuo; Sano, Katusya; Kittaka, Kiyoshi; and Sakakibara, Tetsuya, 5,063,095, Cl. 428-35.800.
Sakamoto, Eiji: *See*—
Mori, Tetsuzo; Sakamoto, Eiji; Hara, Shinichi; Uda, Koji; Shimoda, Isamu; Uzawa, Shunichi; and Ozawa, Kunitaka, 5,063,582, Cl. 378-34.000.
Sakamoto, Hiroaki: *See*—
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, 5,062,771, Cl. 417-201.000.
Sakamoto, Hiroshi: *See*—
Harada, Kosuke; and Sakamoto, Hiroshi, 5,063,488, Cl. 363-16.000.
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Iida, Yoshikazu; Sakamoto, Hiroshi; and Matsui, Hideki, 5,063,403, Cl. 354-413.000.
Sakamoto, Katsuhiko; Kawaguchi, Akira; and Ishikawa, Yasuhiro, to AMP Incorporated. High-frequency connector and method of manufacturing thereof. 5,062,809, Cl. 439-581.000.
Sakanoue, Ken, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,063,145, Cl. 430-505.000.
Sakata, Hirotsugu: *See*—
Hattori, Hitoshi; Sakata, Hirotsugu; Hayano, Makoto; Okuda, Masayuki; and Morozumi, Naoya, 5,062,778, Cl. 418-220.000.
Sakauchi, Takashi: *See*—
Nomura, Takuji; Miki, Shogo; Sakauchi, Takashi; Sato, Yoshitaka; and Honma, Yuusuke, 5,062,981, Cl. 252-62.540.
Sakiyama, Keizo: *See*—
Yamauchi, Yoshimitsu; and Sakiyama, Keizo, 5,063,425, Cl. 357-23.600.
Sakurai, Kazunori: *See*—
Sakai, Hiroshi; Asai, Masamichi; Hayashi, Kenzo; Sakurai, Kazunori; and Watanabe, Kazuhiko, 5,062,554, Cl. 222-600.000.
Sakuta, Shigeru; and Ueda, Katsunobu, to Kabushiki Kaisha Toshiba. Aligning apparatus with a coarse/fine movement controller and an ultrafine movement controller. 5,062,712, Cl. 356-400.000.
Salamy, Thomas E., to OCG Microelectronic Materials, Inc. Positive-working photoresist process employing a selected mixture of ethyl lactate and ethyl 3-ethoxy propionate as casting solvent during photoresist coating. 5,063,138, Cl. 430-326.000.
Saliba, Bernard, to Automobiles Peuqeot; and Automobiles Citroen. Braking device for automotive vehicle fitted with an electric motor. 5,062,317, Cl. 74-560.000.
Salomon S.A.: *See*—
Billet, Philippe; and Demarchi, Jean-Louis, 5,062,222, Cl. 36-2.600.
Samad, Tariq, to Honeywell Inc. Method for scale and rotation invariant pattern recognition. 5,063,605, Cl. 382-44.000.
Samaniego, Felix, to Transport Technology Corporation. Material handling system. 5,062,760, Cl. 414-542.000.
Samejima, Kazuo; and Kawakita, Hiroaki, to Kubota LTD. Terrain traversing apparatus having means for transferring grass clippings to collection box. 5,062,258, Cl. 56-202.000.
Sampath, Sanjay: *See*—
Anand, Vidhu; Sampath, Sanjay; Davis, Clarke D.; and Houck, David L., 5,063,021, Cl. 419-12.000.
Samsung Electron Devices Co., Ltd.: *See*—
Cho, Suk-rae, 5,063,326, Cl. 313-414.000.
SamSung Electronics Co., Ltd.: *See*—
Kim, Ki-Joon, 5,063,420, Cl. 357-17.000.
Kwon, Oh-Seol, 5,063,593, Cl. 379-386.000.

Park, Tae-Hong. 5,063,471, Cl. 361-18.000.
Seo, Jung-Hoon; and Seo, Sung-Mo, 5,063,597, Cl. 381-47.000.
Samuel C. Oliphant: *See*—
Oliphant, Sameul C.; and Gormley, David E., 5,062,281, Cl. 62-457.100.
Samuels, Terry G. Powered height changer for improved power curber. 5,062,737, Cl. 404-98.000.
Sanden Corporation: *See*—
Shimizu, Shigemi; and Takai, Kazuhiko, 5,062,772, Cl. 417-269.000.
Takamura, Toshiyuki; Kurihashi, Kazunari; and Harada, Masazumi, 5,062,545, Cl. 221-152.000.
Sanders, James R.: *See*—
Hammons, Alva C.; Sanders, James R.; and Ulrich, Franklin J., 5,062,327, Cl. 81-124.300.
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—Takemasa, Kazuo, 5,062,985, Cl. 252-67.000.
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Satoh, Kozo: *See*—
Kuhara, Shigehide; and Satoh, Kozo, 5,063,348, Cl. 324-307.000.
Satoh, Masaharu; Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Fukuyama, Kensuke, to Nissan Motor Company, Limited. Pressure medium fluid circuit for active suspension system with variable fluid source discharge rate depending upon magnitude of stroke in relative displacement between vehicular body and suspension member. 5,062,660, Cl. 280-707.000.
Satoh, Takeshi, to Takata Corporation. Module cover of air bag system. 5,062,663, Cl. 280-743.000.
Satoh, Yukihiko, to Alps Electric Co., Ltd. Illuminating switch apparatus. 5,063,479, Cl. 362-32.000.
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, to Hitachi, Ltd.; and Hitachi Tokyo Electronics Co. Ltd. Vacuum system with a secondary gas also connected to the roughing pump for a semiconductor processing chamber. 5,062,771, Cl. 417-201.000.
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Miwa, Hiroshi; Miyoshi, Atuko; Satou, Syungi; and Kaseda, Masayuki, 5,063,528, Cl. 364-559.000.
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Killilea, Timothy R.; and Sattler, David W., 5,062,334, Cl. 83-99.000.
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Davidowski, Dennis J.; Saunders, Michael J.; and O'Brien, Steven M., 5,063,494, Cl. 395-800.000.
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Sawyer, Alan G.; Hughes, Dale L.; and Petree, Edwyn H., to Sawyer, Alan G.; and Hughes, Dale L. Cable stripping tool. 5,062,192, Cl. 29-426.400.
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Carr, Daniel J.; Scally, Charles R.; McClennen, Bill M.; Carney, Michael D.; Volkoday, George; and Walsh, Thomas J., 5,063,392, Cl. 346-46.000.
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FitzHenry, Patrick; and Scanlan, Lawrence A., 5,063,607, Cl. 382-50.000.
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Scharf, Rolf; and Schmitz, Karl-Heinz, to Ecolab Inc. Soap free conveyor lubricant that gives clear solutions in water comprising alkoxyphosphate ester, alkyl benzene sulfonate and carboxylic acid. 5,062,979, Cl. 252-49.300.
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Finlayson, Roger M.; Scharmann, Harry; and Vermaas, Leo F., 5,063,076, Cl. 426-602.000.
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Oberkersch, Angelika; Pirmann, Anton; and Schausberger, Helmut, 5,063,401, Cl. 354-320.000.
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Grosspietsch, Wolfgang; and Scheer, Erich, 5,062,513, Cl. 192-70.170.

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Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 5,063,241, Cl. 514-383.000.

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Smith, Irl W.; and Schindler, Manfred J., 5,063,361, Cl. 332-103.000.

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Schlitt, George J., to Cooper Industries, Inc. Continuous tape measure. 5,062,215, Cl. 33-755.000.

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Petersen, Kurt E.; Barth, Philip W.; Bryzek, Janusz; and Mallon, Joseph R., Jr., 5,062,302, Cl. 73-754.000.

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Nishihara, H. Keith; Crossley, P. Anthony; Hunt, Neil D.; and Tenenbaum, J. Martin, 5,062,567, Cl. 228-105.000.

Schmid, Hans-Dieter: *See*—
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Schmitt, Philipp; and Stehr, Norbert, to Draiswerke GmbH. Agitator mill. 5,062,577, Cl. 241-171.000.

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Schroeder, Donald E., Jr.; and Falk, David O., to Marathon Oil Company. Method of gravel packing a subterranean well. 5,062,484, Cl. 166-278.000.

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Bauer, Peter; Konrad, Rainer; Morgenstern, Herbert; and Schuch, Horst, 5,063,016, Cl. 264-211.210.

Schucker, Robert C., to Exxon Research & Engineering Company. Highly aromatic polyurea/urethane membranes and their use of the separation of aromatics from non-aromatics. 5,063,186, Cl. 502-4.000.

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Schwartz, Stan: *See*—
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McDermott, Wayne T.; Ockovic, Richard C.; Wu, Jin J.; Cooper, Douglas W.; Schwarz, Alexander; and Wolfe, Henry L., 5,062,898, Cl. 134-7.000.

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Humble, John D.; Searles, Raymond C.; Ruggles, John D.; and Jacobowitz, Judah L., 5,063,028, Cl. 422-144.000.

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—Shiokawa, Shoko; Matsui, Yoshikazu; and Ueda, Toshihiko, 5,063,396, Cl. 346-140.00R.

Seiko Instruments Inc.: *See*—
—Watanabe, Shunji, 5,062,888, Cl. 75-739.000.

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—Matsuda, Takumi, 5,062,382, Cl. 119-51.040.

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Selkirk, Alastair B.; and Dey, Michael J., to Syntex Pharmaceuticals, Ltd. Parenteral formulations of 1-diphenylmethyl-4-((2-(4-methylphenyl)-5-methyl-1H-imidazol-4-yl)methyl)piperazine. 5,063,220, Cl. 514-161.000.

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Anderson, Richard L., 5,062,446, Cl. 137-468.000.

Senco Products, Inc.: *See*—
Michael, James V., 5,062,562, Cl. 227-111.000.

Senior, Robert B.; and Hvizdos, Edward L., to Innovated, Inc. Pneumatic press. 5,062,357, Cl. 100-53.000.

Seno, Eugene T.: *See*—
Cox, Karen L.; Seno, Eugene T.; and Wild, Gene M., 5,063,155, Cl. 435-76.000.

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Yoon, Seok G.; and Seo, Jeong Y., 5,062,915, Cl. 156-252.000.

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Domoto, Gerald A.; and Sereny, Aron, 5,063,413, Cl. 355-296.000.

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Strauch, Eric C.; and Severa, William D., 5,062,634, Cl. 273-67.00R.

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Melanotte, Massimo; and Bellezza, Orio, 5,063,424, Cl. 357-23.500.

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Ryan, Richard P.; Shaffer, Glenn W.; Halstead, Gary A.; Smith, David M.; and Joshi, Shrikant M., 5,062,476, Cl. 165-173.000.

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Glaser, Evan R.; and Shanabrook, Benjamin V., 5,063,419, Cl. 357-16.000.

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Shapiro, Roy A., to AT&T Bell Laboratories. Telephone subscriber line fault detector. 5,063,585, Cl. 379-30.000.
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Yamauchi, Yoshimitsu; and Sakiyama, Keizo, 5,063,425, Cl. 357-23.600.
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Shaw, David N., to Carrier Corporation. Unloading system for two compressors. 5,062,274, Cl. 62-117.000.
Shaw, David N.: *See*—
Heitmann, Erric L.; and Shaw, David N., 5,062,277, Cl. 62-193.000.
Sheets, Harold D. Tool coupler. 5,062,749, Cl. 408-240.000.
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Newton, Trevor W.; and McArthur, Alastair, 5,062,882, Cl. 71-93.000.
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Coleman-Kammula, Seetha; and Gillemans, Johannes C. M., 5,063,088, Cl. 427-352.000.
Kemp, Richard A., 5,062,947, Cl. 208-216.00R.
Muijs, Herman M.; Beers, Nicolaas C. M.; and Roefs, Sebastianus P. F. M., 5,062,970, Cl. 252-8.554.
Shelton, Homer, Jr.: *See*—
Goetz, Frederick E.; Miller, Michael S.; and Shelton, Homer, Jr., 5,062,671, Cl. 292-175.000.
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Shibuya, Kazuhiko: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.
Shibuya, Kenichi; Okubo, Hirotsugu; and Furudate, Yukio, to Sony Corporation. Timer programming apparatus. 5,063,543, Cl. 368-29.000.
Shibuya, Toru: *See*—
Okajima, Masayuki; and Shibuya, Toru, 5,063,443, Cl. 358-133.000.
Shieh, Wen-Yau. Prefab filter tank with warning function. 5,062,950, Cl. 210-86.000.
Shiels, Alan J.: *See*—
Cobden, Ronald C.; and Shiels, Alan J., 5,062,369, Cl. 105-396.000.
Shigemori, Toshihiro, to Ricoh Company, Ltd. Optical disk apparatus with data transfer rate and rotational speed variable by annular zones. 5,063,552, Cl. 369-50.000.
Shigeno, Yoshiharu; Murata, Michihiro; Nishino, Yu; Fukui, Norio; and Yamamoto, Keizou, to Murata Mfg. Co., Ltd. Magnetic sensor having a base with magnetoresistors and a magnet mounted on the base. 5,063,347, Cl. 324-235.000.
Shigeo, Nakamura, to Fanuc Ltd. Switching regular undervoltage detector. 5,063,491, Cl. 363-56.000.
Shigeta, Mitsuhiro: *See*—
Suzuki, Akira; Furukawa, Katsuki; Shigeta, Mitsuhiro; and Fujii, Yoshihisa, 5,063,421, Cl. 357-17.000.
Shih, Hsiao-Lei: *See*—
Liu, Yun-Yu; Shih, Hsiao-Lei; Chyou, Yang-Chih; and Laiw, Ming-Shing, 5,062,805, Cl. 439-404.000.
Shih, Jason C. H.; and Williams, C. Michael, to North Carolina State University. Method of degrading keratinaceous material and bacteria useful therefor. 5,063,161, Cl. 435-252.500.
Shimada, Takahisa; Yamaki, Toshio; Tsuji, Kenji; Nakai, Masaaki; Fujino, Akihiko; and Ootsuka, Hiroshi, to Minolta Camera Kabushiki Kaisha. Apparatus for retracting a photo-taking lens. 5,063,402, Cl. 354-400.000.
Shimadzu Corporation: *See*—
Hayashi, Shigeki, 5,063,296, Cl. 250-396.0ML.
Shimazaki, Masaki: *See*—
Inomata, Mitsugu; Nakao, Fumio; Maekawa, Takashi; Uchiyama, Kaneastu; Endo, Tetsu; Nobue, Kazuo; Shimazaki, Masaki; and Idouji, Shigeki, 5,062,726, Cl. 400-630.000.
Shimizu Construction Co., Ltd.: *See*—
Kumagai, Takenori, 5,062,243, Cl. 52-66.000.
Shimizu, Shigemi; and Takai, Kazuhiko, to Sanden Corporation. Slant plate type compressor. 5,062,772, Cl. 417-269.000.
Shimizu, Takaaki: *See*—
Takita, Masatoshi; and Shimizu, Takaaki, 5,063,181, Cl. 501-54.000.
Shimizu, Toshiharu, to Yamaha Hatsudoki Kabushiki Kaisha. Shifting device for lawn mower and the like. 5,062,510, Cl. 192-4.00C.
Shimizu, Yasuo: *See*—
Niwa, Takahiro; and Shimizu, Yasuo, 5,063,098, Cl. 428-76.000.
Shimoda, Isamu: *See*—
Mori, Tetsuzo; Sakamoto, Eiji; Hara, Shinichi; Uda, Koji; Shimoda, Isamu; Uzawa, Shunichi; and Ozawa, Kunitaka, 5,063,582, Cl. 378-34.000.
Shimokoriyama, Makoto: *See*—
Yoshimura, Katsuji; Aoki, Akio; Shimokoriyama, Makoto; Kashida, Motokazu; Yamashita, Shinichi; and Nagasawa, Kenichi, 5,063,453, Cl. 360-32.000.
Shimura, Teruyuki, to Mitsubishi Denki Kabushiki Kaisha. Method of producing a bipolar transistor with spacers. 5,063,167, Cl. 437-31.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Takita, Masatoshi; and Shimizu, Takaaki, 5,063,181, Cl. 501-54.000.
Shinjo, Goro: *See*—
Ohtsubo, Toshiro; Tsuda, Shigenori; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 5,063,059, Cl. 424-408.000.
Shinnihon Jushikako Co., Ltd.: *See*—
Tahara, Tetsuo, 5,063,006, Cl. 264-35.000.
Shinozaki, Eiji, to NEC Corporation. Transistor write current switching circuit for magnetic recording. 5,063,310, Cl. 307-570.000.
Shioda, Michio: *See*—
Hayashi, Minoru; Matsufuji, Mitoshi; Takahashi, Sakae; Kamiji, Koichi; Kobari, Kouichi; Kishimoto, Junichi; Shioda, Michio; and Kawaguchi, Masaaki, 5,062,367, Cl. 102-530.000.
Shioiri, Shigeo; and Kanda, Kunio, to Somar Corporation. Method of preparing broadcast sequence control data and apparatus for implementing said method. 5,063,493, Cl. 364-192.000.
Shiokawa, Shoko; Matsui, Yoshikazu; and Ueda, Toshihiko, to Seiko Epson Corporation. Droplets jetting device. 5,063,396, Cl. 346-140.00R.
Shionogi & Co., Ltd.: *See*—
Saitoh, Izumi; and Sasaki, Yoshio, 5,063,048, Cl. 424-59.000.
Shiotsuki, Masao: *See*—
Miyao, Hidehiko; Ikeda, Satoshi; Shiotsuki, Masao; Kawamura, Shigeyoshi; Komatsu, Fumiaki; Takagi, Ikuji; and Sakai, Tadamiti, 5,063,001, Cl. 264-0.500.
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, to Tokyo Electric Co., Ltd. Thermal printer with reciprocal paper feed control. 5,062,722, Cl. 400-120.000.
Shipley Company Inc.: *See*—
Dillon, John R.; and O'Connor, James D., 5,062,930, Cl. 204-82.000.
Shipman, Carol L.: *See*—
Lindsey, James D.; Hutton, Charles D.; Tubb, Joe W.; Shipman, Carol L.; and Kyle, Albert S., III, 5,063,507, Cl. 364-408.000.
Shippers Paper Products Company: *See*—
Liebel, Henry L., 5,062,751, Cl. 410-154.000.
Shira, Chester S. Method of making a golf club head and the article produced thereby. 5,062,638, Cl. 273-167.00R.
Shirasugi, Kouji, to Ricoh Company, Ltd. Copier allowing successive copying operations while avoiding certain waiting period. 5,063,414, Cl. 355-296.000.
Shklyarov, Isaak M.: *See*—
Braverman, Robert J.; and Shklyarov, Isaak M., 5,062,230, Cl. 42-1.090.
Braverman, Robert J.; and Shklyarov, Isaak M., 5,062,231, Cl. 42-1.090.
Shockley, Dru. Shopping bag with handle. 5,062,717, Cl. 383-20.000.
Shoei Kako Kabushiki Kaisha: *See*—
Kamata, Eitaro, 5,062,162, Cl. 2-424.000.
Shorter, David U., to International Business Machines Corporation. System for executing segments of application program concurrently/serially on different/same virtual machine. 5,063,500, Cl. 395-200.000.
Showa Alumi Powder K.K.: *See*—
Ozawa, Sinya; Kondo, Katsumi; and Saito, Kajin, 5,062,886, Cl. 75-371.000.
Shuman, David W.: *See*—
Jasinski, Joseph E.; Lingle, Charles H.; Pollitt, Richard F.; and Shuman, David W., 5,063,289, Cl. 250-221.000.
Shurtz, Richard R., II; Sharp, Edward J.; and Miller, James E., to United States of America, Army. Optical non-linear artificial dielectrics. 5,063,418, Cl. 357-15.000.
Sicka, Richard W.: *See*—
Tompkins, Dale A.; and Sicka, Richard W., 5,062,782, Cl. 425-113.000.
Siegal, Burton L., to Sellstrom Manufacturing Company. Face shield filter plate retention. 5,062,156, Cl. 2-8.000.
Siegel, Israel. Disposable body cooler. 5,062,269, Cl. 62-4.000.

Siegel, Ronald A., to University of California, The Regents of the. Implantable, self-regulating mechanochemical insulin pump. 5,062,841, Cl. 604-891.100.
Siegel, Shepard L., to Datacube Inc. Adaptive zonal coder. 5,063,608, Cl. 382-56.000.
Siemens Aktiengesellschaft: *See*—
Maghon, Helmut, 5,062,792, Cl. 431-284.000.
Siemens-Albis Aktiengesellschaft: *See*—
Lauper, Alfred; Kupper, Hanspeter; and Rieder, Daniel, 5,063,354, Cl. 328-14.000.
Siemens Automotive L.P.: *See*—
Daly, Paul D., 5,062,405, Cl. 123-468.000.
Sienko, Ronald F.: *See*—
Poillon, Nannette; Canistraro, Howard; and Sienko, Ronald F., 5,062,641, Cl. 273-181.00C.
Sievert, Dick J.: *See*—
Woolford, Michael E.; and Sievert, Dick J., 5,062,610, Cl. 249-52.000.
Sigmon, Bernard E., to Motorola, Inc. Pulse repetition frequency pushing compensation circuit. 5,063,360, Cl. 331-175.000.
Siiman, Olavi; and Burshteyn, Alexander, to Coulter Corporation. In situ use of gelatin in the preparation of uniform ferrite particles. 5,062,991, Cl. 252-315.200.
Silicon Systems, Inc.: *See*—
Yamasaki, Richard G., 5,063,309, Cl. 307-521.000.
Simmler, Kurt: *See*—
Nalowaniec, Krzysztof; and Simmler, Kurt, 5,062,838, Cl. 604-366.000.
Sinatora, Giampaolo: *See*—
Tedesco, Raffaele; Busato, Giampaolo; and Sinatora, Giampaolo, 5,063,099, Cl. 428-109.000.
Singh, Bharat H. Selective flow dispensing container. 5,062,550, Cl. 222-80.000.
Singletary, John: *See*—
Rhoden, Buddy; and Singletary, John, 5,062,675, Cl. 296-1.100.
Sinko, John E. Universal lawn mower blade sharpening machine. 5,062,322, Cl. 76-82.100.
Sinzawa, K.: *See*—
Takano, T.; Kosuga, Y.; and Sinzawa, K., 5,063,277, Cl. 200-531.000.
Siol, Werner: *See*—
Gross, Heinz; Fischer, Jens-Dieter; Siol, Werner; Sufke, Thomas; and Rhein, Thomas, 5,063,112, Cl. 428-412.000.
Sircar, Ila: *See*—
Doherty, Annette M.; Hamilton, Harriet W.; Hodges, John C.; Repine, Joseph T.; and Sircar, Ila, 5,063,207, Cl. 514-18.000.
Siria, Darrel Lee: *See*—
Siria, Darrell L.; Sommerfeld, Lorran; and Raczykowski, Daniel G., 5,062,487, Cl. 169-91.000.
Siria, Darrell L.; Sommerfeld, Lorran; and Raczykowski, Daniel G., to Siria, Darrel Lee. Hand-portable fire fighting positive pressure water misting and ventilation blower. 5,062,487, Cl. 169-91.000.
Sitzler, Hans-Dietrich: *See*—
Fischer, Tilman; Sitzler, Hans-Dietrich; and Ufermann, Werner, 5,063,010, Cl. 264-109.000.
Sjarne, Anders O. G.; and Larsson, Sven-Olof, to SAB Nordic AB. Brake block holder arrangement. 5,062,505, Cl. 188-153.00R.
Sjoberg, Per, to Nobel Kemi AB. Method and a device for filling a space in an ammunition unit with explosive. 5,062,343, Cl. 86-20.100.
Sjoblom, Bengt I. G., to Beco Produktutveckling. Method and apparatus for bending corrugated sheet. 5,062,286, Cl. 72-305.000.
SKF GmbH: *See*—
Bauer, Bernhard; Reichle, Heinz; and Stolz, Robert, 5,062,719, Cl. 384-450.000.
Skraba, Joseph S.: *See*—
Dorr, Lawrence D.; Burkinshaw, Brian D.; and Skraba, Joseph S., 5,062,852, Cl. 623-20.000.
SKW Trostberg Aktiengesellschaft: *See*—
Vollbrecht, Heinz-Rudiger; Cully, Jan; and Wiesmuller, Johann, 5,063,077, Cl. 426-614.000.
Slagowski, Eugene: *See*—
McCarten, Paul; and Slagowski, Eugene, 5,062,924, Cl. 162-358.000.
Slamon, Dennis J.; and Chen, Irvin S. Y., to University of California, The Regents of The. Retroviral polypeptides associated with human cellular transformation. 5,063,150, Cl. 435-5.000.
Slee, James D., to Amoco Corporation. Process for monitoring particle size and moisture content of finely divided material. 5,062,709, Cl. 356-335.000.
Slind, Jay L.: *See*—
Loberger, Gregory C.; and Slind, Jay L., 5,062,790, Cl. 431-114.000.
Smagner, John D. Furnace crown means and method. 5,062,249, Cl. 52-320.000.
SMC Corporation: *See*—
Hasegawa, Yoshitomo; and Tsuchiya, Teruyuki, 5,062,864, Cl. 55-495.000.
Smit, Nicolaas: *See*—
Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; and Wieck, Henry J., 5,063,081, Cl. 427-2.000.
Smith, Carl H.: *See*—
Ramanan, V. R. V.; and Smith, Carl H., 5,062,909, Cl. 148-304.000.
Smith, David A.; and Woody, Clark M., to DowBrands Inc. Hand held, dip-tube style liquid dispenser. 5,062,549, Cl. 222-377.000.
Smith, David A.; and LaCombe, James A., to Dow Brands Inc. Vacuum drum purge method and apparatus. 5,062,603, Cl. 271-195.000.
Smith, David A.; and Woody, Clark M., to Dow Chemical Company, The. Multiple delivery system. 5,062,623, Cl. 271-283.000.
Smith, David A.; and Geiger, Herbert B., to Dow Chemical Company, The. Apparatus and method for the production of flexible products. 5,062,825, Cl. 493-194.000.
Smith, David A.: *See*—
Candland, Calvin T.; Christianson, Kim L.; Kennedy, James L.; Smith, David A.; Nosan, Francis J.; and Overend, Steven F., 5,062,366, Cl. 102-430.000.
Smith, David M.: *See*—
Ryan, Richard P.; Shaffer, Glenn W.; Halstead, Gary A.; Smith, David M.; and Joshi, Shrikant M., 5,062,476, Cl. 165-173.000.
Smith, Dennis W.: *See*—
Borrelli, Nicholas F.; and Smith, Dennis W., 5,062,877, Cl. 65-30.130.
Smith, Gary J., to Alcan International Limited. Process for producing color change devices incorporating latent indicia and the resulting devices. 5,062,928, Cl. 204-15.000.
Smith, Glenn; and Smith, Roseanna. Rose thorn stripper. 5,062,238, Cl. 47-1.010.
Smith, Glenn W., to Robotic Displays Corporation. Display system. 5,063,377, Cl. 340-764.000.
Smith, Irl W.; and Schindler, Manfred J., to Raytheon Company. Serrodyne modulator. 5,063,361, Cl. 332-103.000.
Smith, Lowell S.; and Piel, Edward J., Jr., to General Electric Company. Ultrasound imaging system probe with alternate transducer polling for common-mode noise rejection. 5,062,429, Cl. 128-661.010.
Smith & Nephew plc: *See*—
Miller, Nigel D., 5,063,063, Cl. 424-445.000.
Smith & Nephew Richards Inc.: *See*—
Jamison, Russell D.; Brumfield, David; and Treharne, Richard, 5,062,844, Cl. 606-54.000.
Smith, Patrick J.: *See*—
Leahy, Ronald S.; and Smith, Patrick J., 5,063,572, Cl. 375-1.000.
Smith, Richard L.: *See*—
Martin, Luther W.; and Smith, Richard L., 5,062,207, Cl. 29-890.140.
Smith, Roseanna: *See*—
Smith, Glenn; and Smith, Roseanna, 5,062,238, Cl. 47-1.010.
Smith, Stephen; and Engelhardt, Dale F., to General Motors Corporation. Engine cylinder liner, seals and assembly therewith. 5,062,393, Cl. 123-41.720.
Smith, Steven C. Hypodermic syringe needle detection alarm. 5,063,370, Cl. 340-540.000.
Sobukawa, Hiroshi: *See*—
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 5,062,271, Cl. 62-55.500.
Societe Anonyme Dite Hispano Suiza: *See*—
Allais, Jean-Philippe P. B.; Guillermond, Alain R.; and Rouyer, Pascal G., 5,062,347, Cl. 89-37.070.
Societe d'Applications Generales d'Electricite et de Mecanique Sagem: *See*—
Monnier, Christian, 5,062,604, Cl. 248-27.100.
Societe des Ceramiques Techniques: *See*—
Garcera, Daniel; and Gillot, Jacques, 5,062,910, Cl. 156-82.000.
Societe Europeenne de Propulsion: *See*—
Atlas, Gerard, 5,063,336, Cl. 318-611.000.
Societe LAB: *See*—
Vicard, Jean-Francois, 5,063,034, Cl. 423-235.000.
Societe Nationale Elf Aquitane: *See*—
Gauthier, Michel; Armand, Michel; and Muller, Daniel, 5,063,124, Cl. 429-192.000.
Somar Corporation: *See*—
Kitagawa, Katsuji; Moriguchi, Kazutomo; Miyake, Tetsuo; Sano, Katusya; Kittaka, Kiyoshi; and Sakakibara, Tetsuya, 5,063,095, Cl. 428-35.800.
Kubo, Masao; Miyake, Tetsuo; Matsuzaki, Kunimitsu; and Kitagawa, Katsuji, 5,062,284, Cl. 72-46.000.
Shioiri, Shigeo; and Kanda, Kunio, 5,063,493, Cl. 364-192.000.
Sommer, Karl H.: *See*—
Schlangenotto, Heinrich; and Sommer, Karl H., 5,063,428, Cl. 357-38.000.
Sommer, Norbert, to Boge AG. Self-pumping hydropneumatic shock absorbing strut. 5,062,616, Cl. 267-64.170.
Sommerer, Karl, to Dr.Ing.h.c.F. Porsche Aktiengesellschaft. Wheel suspension system having a lower bearing with two ball joints. 5,062,655, Cl. 280-674.000.
Sommerfeld, Lorran: *See*—
Siria, Darrell L.; Sommerfeld, Lorran; and Raczykowski, Daniel G., 5,062,487, Cl. 169-91.000.
Sonnenschein, Mark F.: *See*—
Roland, Charles M.; and Sonnenschein, Mark F., 5,062,939, Cl. 204-192.170.
Sony Corporation: *See*—
Fukushima, Takashi; and Hishinuma, Takashi, 5,063,458, Cl. 358-335.000.
Miyoshi, Hiroshi; Kamatani, Yoshiteru; Ozue, Tadashi; Narahara, Tatsuya; and Ohsato, Kiyoshi, 5,063,555, Cl. 369-97.000.
Nishida, Norio, 5,063,545, Cl. 369-32.000.
Shibuya, Kenichi; Okubo, Hirotsugu; and Furudate, Yukio, 5,063,543, Cl. 368-29.000.
Takahashi, Kenji, 5,063,558, Cl. 369-291.000.
Takamatsu, Ryoji; Naitou, Osamu; Urushibata, Hiroyuki; and Sato, Masahiro, 5,063,557, Cl. 369-219.000.

Soong, Tai-Sen: *See*—
Chang, Ming-Ju; Hsu, Yuan-Hsun; Kuo, Mei-Hui; and Soong, Tai-Sen, 5,063,244, Cl. 514-456.000.

Sparks, Charles: *See*—
Fuchs, Jean-Francois; Auberon, Marcel; Odru, Pierre; and Sparks, Charles, 5,062,914, Cl. 156-172.000.

Sparktech: *See*—
Shakkottai, Parthasarathy; and Kwack, Eug Y., 5,062,295, Cl. 73-290.00V.

Sparton Corporation: *See*—
Gerker, Thomas F., 5,062,344, Cl. 87-8.000.

Speckner, Ludwig: *See*—
Edelhaeuser, Erhard; Schmid, Hans-Dieter; Speckner, Ludwig; Wutz, Karl; and Steffen, Horst, 5,063,366, Cl. 335-271.000.

Spectral Sciences, Inc.: *See*—
Adler-Golden, Steven; and Matthew, Michael W., 5,062,707, Cl. 356-311.000.

Speed Queen Company: *See*—
Harris, Robert D.; and Putnam, Brett J., 5,062,219, Cl. 34-133.000.

Speer, Elmer: *See*—
Rampolla, Donald S.; and Speer, Elmer, 5,062,186, Cl. 24-389.000.

Spegas Industries Ltd.: *See*—
Rosenfeld, Elieser Z.; and Coleman, Lewis, 5,063,275, Cl. 250-343.000.

Spellman, Joseph X.; Beck, Marlene C.; and Connell, Victoria, to Elizabeth Arden Co., Division of Conopco, Inc. Cosmetic capsules. 5,063,057, Cl. 424-401.000.

Spiewak, John W.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Yanus, John F.; Limburg, William W.; and Mammino, Joseph, 5,063,125, Cl. 430-59.000.
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Mammino, Joseph; Yu, Robert C. U.; Hamilton, Vincent E.; Limburg, William W.; and Chen, Cindy, 5,063,128, Cl. 430-63.000.

Spilburg, Curtis A.: *See*—
Lange, Louis G., III; and Spilburg, Curtis A., 5,063,210, Cl. 514-54.000.

Spina, Kenneth P.: *See*—
Rosenberg, Saul H.; Spina, Kenneth P.; and Crowley, Steven R., 5,063,208, Cl. 514-19.000.

Spine-Tech, Inc.: *See*—
Kuslich, Stephen D.; and Corin, James D., 5,062,845, Cl. 606-80.000.

Spinsafe, Inc.: *See*—
Butler, Johnny L.; Wakeland, Richard E.; Batson, Donald R.; and Metzger, Robert E., 5,062,439, Cl. 137-15.000.

SRI International: *See*—
Mooney, John B.; and Sher, Arden, 5,063,166, Cl. 437-22.000.

Sridhar, Narasi, to Haynes International, Inc. Corrosion resistant Ni-Cr- Si- Cu alloys. 5,063,023, Cl. 420-442.000.

SS Pharmaceutical Co., Ltd.: *See*—
Komoto, Teruo; Okawa, Junji; Ogawa, Yoichiro; Sato, Susumu; Taido, Naokata; and Kuraishi, Tadayuki, 5,063,222, Cl. 514-180.000.

SSI Medical Services, Inc.: *See*—
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,062,167, Cl. 5-61.000.

Standard Oil Company, The: *See*—
Turkevich, Leonid A.; and Choi, Kee-Ju, 5,063,301, Cl. 250-574.000.

Standard Register Company, The: *See*—
Mowry, William H.; Schuelke, James H.; and White, Robert L., 5,062,666, Cl. 283-67.000.

Standard Steel Rail Technology: *See*—
Ballerstein, John E., 5,062,732, Cl. 403-174.000.

Stang, Michael A. Food tray and bib system. 5,062,558, Cl. 224-270.000.

Stanley Electric Co., Ltd.: *See*—
Wasimoto, Takasi; and Kimura, Morio, 5,062,818, Cl. 445-22.000.

Stanley Works, The: *See*—
Bobbowski, Louis G.; and Kon, Richard H., 5,062,181, Cl. 16-354.000.

STC PLC: *See*—
Sapsford, Gary S., 5,062,687, Cl. 350-96.300.

Steele, John: *See*—
Cooper, Kelvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, 5,063,237, Cl. 514-338.000.

Steffan, John: *See*—
Saadi, Robert E.; Becker, Allen R.; Ball, Christopher J.; and Steffan, John, 5,062,453, Cl. 137-624.110.

Steffen, Horst: *See*—
Edelhaeuser, Erhard; Schmid, Hans-Dieter; Speckner, Ludwig; Wutz, Karl; and Steffen, Horst, 5,063,366, Cl. 335-271.000.

Stegelmeier, Hartmut: *See*—
Schwenner, Eckhard; Stegelmeier, Hartmut; Kazda, Stanislav; and Knorr, Andreas, 5,063,239, Cl. 514-357.000.

Stehr, Norbert: *See*—
Schmitt, Philipp; and Stehr, Norbert, 5,062,577, Cl. 241-171.000.

Steiner, Susan: *See*—
Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauka, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; and Wieck, Henry J., 5,063,081, Cl. 427-2.000.

Stenstrom, Theiss; Molbaek, Jens J.; Hyldig, Poul E.; and Straede, Bjarne, to Danfoss A/S. Apparatus for monitoring a fluid conduit system for leakage points. 5,062,442, Cl. 137-110.000.

StereoGraphics Corporation: *See*—
Lipton, Lenny; and Meyers, Lawrence D., 5,063,441, Cl. 358-88.000.

Sterling Design International: *See*—
Gullett, Paul D. M., 5,062,481, Cl. 166-153.000.

Stevens, Robert B.; and Hunter, Orville, Jr., to A. P. Green Industries, Inc. Low silica ceramic fiber. 5,063,180, Cl. 501-38.000.

Stewart, Ralph D., to Leggett & Platt, Incorporated. Bedding mattress spring assembly having border edge support. 5,062,172, Cl. 5-474.000.

Sticht, Walter; and Heiml, Roland, to STIWA-Gertigungstechnik Sticht Gesellschaft m.b.H. Assembly line for working and mounting structural parts. 5,062,368, Cl. 104-172.300.

STIWA-Gertigungstechnik Sticht Gesellschaft m.b.H.: *See*—
Sticht, Walter; and Heiml, Roland, 5,062,368, Cl. 104-172.300.

Stockinger, Hubertus, to Boefringer Mannheim GmbH. Serum-free culture medium for mammalian cells. 5,063,157, Cl. 435-240.200.

Stolpmann, James R.: *See*—
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,062,167, Cl. 5-61.000.

Stolz, Robert: *See*—
Bauer, Bernhard; Reichle, Heinz; and Stolz, Robert, 5,062,719, Cl. 384-450.000.

Stolzer, Rainer, to Hydromatik GmbH. Hydrostatic transmission containing an axial piston motor located in a recess of a valve controlled axial piston pump. 5,062,267, Cl. 60-493.000.

Story, Carl E.; Nichols, Jerry A.; and Cady, Byron C., to Systems Chemistry, Inc. Fluid pumping apparatus and system with leak detection and containment. 5,062,770, Cl. 417-46.000.

Stout, Timothy R., to T and G Technologies, Inc. Method of operating a still. 5,062,927, Cl. 203-89.000.

Stowe, Keith A.: *See*—
Hynds, Ernest J.; Stowe, Keith A.; and Cook, David C., 5,062,656, Cl. 280-689.000.

Straede, Bjarne: *See*—
Stenstrom, Theiss; Molbaek, Jens J.; Hyldig, Poul E.; and Straede, Bjarne, 5,062,442, Cl. 137-110.000.

Strata Flotation, Inc.: *See*—
Johenning, John B., 5,062,170, Cl. 5-450.000.

Strauch, Eric C.; and Severa, William D., to Wilson Sporting Goods Co. Squash racket. 5,062,634, Cl. 273-67.00R.

Strippit, Inc.: *See*—
Johnson, Gary E.; and Eckert, Richard M., 5,062,337, Cl. 83-552.000.

Stroud, James W., III; and Dodds, John F., to Allen-Bradley Company, Inc. Injection molding controller with process variable learning. 5,062,785, Cl. 425-145.000.

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Weatherby, John H.; and Potts, Jack M., 5,062,415, Cl. 128-76.00R.

Stucks, Albert A. Penile erection system. 5,062,416, Cl. 128-79.000.

Studsgaard, Leif: *See*—
Hansen, Henry; Studsgaard, Leif; and Laursen, Erik, 5,062,305, Cl. 73-861.120.

Stulens, Ludo M. J.: *See*—
Custers, Pieter H.; and Stulens, Ludo M. J., 5,063,547, Cl. 369-32.000.

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Burgfels, Gotz; Kochloefl, Karl; Ladebeck, Jurgen; Schmidt, Friedrich; Schneider, Michael; and Wernicke, Hans J., 5,063,187, Cl. 502-71.000.

Suda, Hideo; Sato, Norimasa; Takada, Katsuhiko; Susa, Sumio; Aiyoshizawa, Yasushi; and Omata, Kenichi, to Furukawa Electric Co., Ltd., The; and Nippondenso Co., Ltd. Copper fin material for heat-exchanger and method of producing the same. 5,063,117, Cl. 428-610.000.

Sue, Jiinjen A., to Union Carbide Coatings Service Technology Corporation. Electrolytic process for stripping a metal coating from a titanium based metal substrate. 5,062,941, Cl. 204-146.000.

Sufke, Thomas: *See*—
Gross, Heinz; Fischer, Jens-Dieter; Siol, Werner; Sufke, Thomas; and Rhein, Thomas, 5,063,112, Cl. 428-412.000.

Suga, Yasunori: *See*—
Kanba, Masaru; Inoue, Yasuo; Mukai, Sadayoshi; Kikkawa, Masanari; and Suga, Yasunori, 5,062,292, Cl. 73-19.010.

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Sugawara, Motoaki: *See*—
Seo, Yasutsugu; and Sugawara, Motoaki, 5,062,427, Cl. 128-661.100.

Sugawara, Tomoo; and Yamato, Motoyuki, to Nippon Zeon Co., Ltd. Reinforced polymeric matrix. 5,063,103, Cl. 428-285.000.

Sugawara, Yukio: *See*—
Sukekawa, Izumi; Asao, Haruhiko; Kohno, Hiroshi; Sugawara, Yukio; and Nogami, Keiji, 5,062,614, Cl. 266-216.000.

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Sugita, Shuichi; Mizukura, Noboru; Kohno, Junichi; Kadokura, Kenzi; and Tomotake, Atsushi, to Konica Corporation. Silver halide light-sensitive photographic material. 5,063,148, Cl. 430-551.000.

Sugiura, Ikuzo: *See*—
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, 5,062,722, Cl. 400-120.000.

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Tanaka, Hideaki; Hirata, Toichi; Sugiyama, Genroku; Haga, Masakazu; and Kajita, Yusuke, 5,062,350, Cl. 91-448.000.

Sugiyama, Yoshiyuki: *See*—
Sato, Takeo; Yamamoto, Masaki; Aoki, Shinichiro; Sugiyama, Yoshiyuki; Nakaniahi, Yoshito; and Takeuchi, Hiroyuki, 5,062,705, Cl. 356-124.000.

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Sulima, Edward J., Jr.: *See*—
Berringer, William A.; and Sulima, Edward J., Jr., 5,062,857, Cl. 623-25.000.

Sullivan, Jeffrey R.: *See*—
McCauley, Durham S.; and Sullivan, Jeffrey R., 5,062,325, Cl. 81-436.000.

Sulzer Brothers Limited: *See*—
Goetz, Roland, 5,063,118, Cl. 428-614.000.

Sumitani, Tomoaki: *See*—
Kambara, Hideki; Nishikawa, Tetsuo; Sumitani, Tomoaki; Nagai, Keiichi; and Ito, Yoshitoshi, 5,062,942, Cl. 204-299.00R.

Sumitomo Chemical Co., Ltd.: *See*—
Ohtsubo, Toshiro; Tsuda, Shigenori; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 5,063,059, Cl. 424-408.000.

Sumitomo Electric Industries, Ltd.: *See*—
Okamoto, Satoru; Terazi, Kazufumi; Nishino, Seiichi; and Bonkohara, Manabu, 5,063,435, Cl. 357-74.000.

Sumitomo Light Metal Industries, Ltd.: *See*—
Tanaka, Hiroki; and Tsuchida, Shin, 5,062,901, Cl. 148-11.50A.

Sumiyoshi, Hideo: *See*—
Chiba, Kazuharu; Nakajima, Yoshifumi; and Sumiyoshi, Hideo, 5,063,568, Cl. 372-32.000.

Sun, Brian Y., to Keytec, Inc. Method of making a transparent touch screen switch assembly. 5,062,198, Cl. 29-622.000.

Sun Chemical Corporation: *See*—
Schwartz, Russell J.; Zwirgzdas, Anthony C.; and Chamberlain, Terence R., 5,062,894, Cl. 106-23.000.

Sun Microsystems, Inc.: *See*—
Lien, Sheue-Ling; Shantz, Michael J.; Carrie, Susan E.; Loo, Jim V.; and Elrod, David, 5,063,375, Cl. 340-703.000.

Sunada, Satoru, to Kabushiki Kaisha Toshiba. Heating cooker with temperature control system. 5,063,284, Cl. 219-497.000.

Sundstrand Corporation: *See*—
Anderson, W. Kyle, 5,063,318, Cl. 310-156.000.
Markunas, Albert L., 5,062,265, Cl. 60-450.000.
Shekleton, Jack R.; and Johnson, Douglas C., 5,062,262, Cl. 60-39.360.

Sundstrand Heat Transfer, Inc.: *See*—
Bemisderfer, Charles H.; and Wanner, James A., 5,062,475, Cl. 165-151.000.

Sung, Chien-Min: *See*—
Chen, Sy-Hwa; and Sung, Chien-Min, 5,062,865, Cl. 51-295.000.

Sunkara, Sai P.; and Jones, Winton D., to Merrell Dow Pharmaceuticals Inc. Prevention of glycoprotein enveloped virus infectivity by pyridinyloxazole-2-ones. 5,063,238, Cl. 514-340.000.

Sunshon Molding Co., Ltd.: *See*—
Chiu, Hsiu-Hui, 5,062,178, Cl. 16-38.000.

Suntory, Ltd.: *See*—
Cho, Hidetsura; Ueda, Masaru; Tamaoka, Mie; Hamaguchi, Mikiko; Murota, Seiitsu; and Morita, Ikuo, 5,063,243, Cl. 514-438.000.

Suomen Xyrofin Oy: *See*—
Kruger, Christof; and Cappelmann, Karl, 5,063,080, Cl. 426-660.000.

Surig, Udo: *See*—
Jurgens, Gunter; Surig, Udo; and Lang, Lothar, 5,063,510, Cl. 364-424.100.

Susa, Sumio: *See*—
Suda, Hideo; Sato, Norimasa; Takada, Katsuhiko; Susa, Sumio; Aiyoshizawa, Yasushi; and Omata, Kenichi, 5,063,117, Cl. 428-610.000.

Susaki, Toshihiko: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

Sutton, Alexander C.: *See*—
Pate, Gerry E.; Mullinax, Ronald L.; Sutton, Alexander C.; and Ross, Jeff E., 5,063,505, Cl. 364-400.000.

Sutton, Roger L., to Golden Needles Knitting and Glove Co., Inc. Method of making garment, garment and strand material. 5,062,161, Cl. 2-169.000.

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Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,062,167, Cl. 5-61.000.

Suzuki, Akira; Furukawa, Katsuki; Shigeta, Mitsuhiro; and Fujii, Yoshihisa, to Sharp Kabushiki Kaisha. Silicon carbide light emitting diode having a pn junction. 5,063,421, Cl. 357-17.000.

Suzuki, Isao: *See*—
Gotoh, Shigeyuki; Yokota, Kazunori; and Suzuki, Isao, 5,062,306, Cl. 73-862.330.

Suzuki, Kazuo: *See*—
Sekiya, Tetsuo; Inoue, Shinya; Taniguchi, Masao; Umezu, Kohei; and Suzuki, Kazuo, 5,063,247, Cl. 514-585.000.

Suzuki, Kazuya: *See*—
Watanuki, Yoshio; Mochida, Haruo; Inoue, Masaru; Suzuki, Kazuya; and Tanaka, Masaki, 5,062,312, Cl. 74-89.140.

Suzuki, Kunioki: *See*—
Hashimoto, Nobuo; Suzuki, Kunioki; and Saijo, Teruaki, 5,062,297, Cl. 73-597.000.

Suzuki, Norio: *See*—
Kawata, Yutaka; Inoue, Ken-ichi; Ishibashi, Kiyotaka; Kobayashi, Akira; Inoue, Koji; Suzuki, Norio; Arai, Akio; Yamada, Kaneo; Tokushige, Keizo; Fukuyama, Hirofumi; Adachi, Shigeto; Furukawa, Yukito; Takahashi, Sunao; and Kimura, Makoto, 5,063,294, Cl. 250-309.000.

Suzuki, Shoji; and Yatsu, Kenji, to Alpine Electronics Inc. Cartridge guiding device for disk player. 5,063,553, Cl. 369-77.100.

Svarovsky, James E.: *See*—
Baechtel, Donald F.; Svarovsky, James E.; and Rehm, Thomas, 5,063,335, Cl. 318-609.000.

Swapp, Mavin C., to Motorola, Inc. Programmable time delay circuit for digital logic circuits. 5,063,311, Cl. 307-603.000.

Swedemede AB: *See*—
Wiksell, Hans, 5,062,827, Cl. 604-22.000.

Sweetman, Robert J. Process and apparatus for removing organic contaminants from a fluid. 5,063,030, Cl. 422-189.000.

SWF Auto-Electric GmbH: *See*—
Bruhn, Rainer, 5,063,317, Cl. 310-91.000.

Sykes, Christopher C. Partition structures and frame elements therefor. 5,062,246, Cl. 52-126.400.

Syntex Pharmaceuticals, Ltd.: *See*—
Selkirk, Alastair B.; and Dey, Michael J., 5,063,220, Cl. 514-161.000.

Syntex (U.S.A.) Inc.: *See*—
Hu, Mae W.; Schulkamp, Kirk; Lin, Cheng-I; and Ullman, Edwin F., 5,063,165, Cl. 436-500.000.

Syntone: *See*—
Martin, Martial G. E.; and Nuttin, Pierre L. V., 5,062,597, Cl. 270-39.000.

System 3R USA, Inc.: *See*—
Ramsbro, Borje K. H., 5,063,013, Cl. 269-136.000.

Systems Chemistry, Inc.: *See*—
Story, Carl E.; Nichols, Jerry A.; and Cady, Byron C., 5,062,770, Cl. 417-46.000.

Sytstra, Jan R.: *See*—
De Gier, Gertrudis M. G.; and Sytstra, Jan R., 5,062,227, Cl. 37-117.500.

Szempruch, Walter T.: *See*—
Kramer, David E.; Muetterties, Andrew J.; and Szempruch, Walter T., 5,062,774, Cl. 417-413.000.

Szyms, Walter; and Valaitis, Joseph W., to Firelli Armstrong Tire Corporation. Reinforced tire curing bladder. 5,062,781, Cl. 425-52.000.

T and G Technologies, Inc.: *See*—
Stout, Timothy R., 5,062,927, Cl. 203-89.000.

Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Solid state pickup system having improved color reproducibility. 5,063,439, Cl. 358-41.000.

Tacchetto, Maurizio, to Nordica S.p.A. Ski boot with variable-inclination upper spoiler. 5,062,224, Cl. 36-117.000.

Tachibana, Yoshitaka: *See*—
Takeda, Masatoshi; Aritsuka, Tomohiko; and Tachibana, Yoshitaka, 5,063,532, Cl. 364-825.000.

Tachikawa, Hiromichi: *See*—
Yokoya, Hiroaki; Tachikawa, Hiromichi; and Watarai, Syu, 5,063,129, Cl. 430-83.000.

Tagami, Kiyoshi: *See*—
Asaba, Eiki; Tanabe, Yoshihito; and Tagami, Kiyoshi, 5,063,295, Cl. 250-231.140.

Taguchi, Hiroya: *See*—
Takeda, Fumio; Yoshida, Takashi; Taguchi, Hiroya; Omine, Tsutomu; and Asano, Mitsugu, 5,062,723, Cl. 400-120.000.

Taguchi, Nobuyoshi: *See*—
Imai, Akihiro; Kawakami, Tetsuji; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, 5,063,198, Cl. 503-227.000.

Tahara, Tetsuo, to Shinnihon Jushikako Co., Ltd. Methods for repairing cracks in concrete structures. 5,063,006, Cl. 264-35.000.

Taido, Naokata: *See*—
Komoto, Teruo; Okawa, Junji; Ogawa, Yoichiro; Sato, Susumu; Taido, Naokata; and Kuraishi, Tadayuki, 5,063,222, Cl. 514-180.000.

Taiyo Seiki Iron Works Co., Ltd.: *See*—
Takaguchi, Hiroyuki, 5,062,752, Cl. 411-347.000.

Takada, Katsuhiko: *See*—
Suda, Hideo; Sato, Norimasa; Takada, Katsuhiko; Susa, Sumio; Aiyoshizawa, Yasushi; and Omata, Kenichi, 5,063,117, Cl. 428-610.000.

Takagi, Atsushi, to Fuji Photo Film Co., Ltd. Method and apparatus for recording image. 5,063,407, Cl. 355-68.000.

Takagi, Ikuji: *See*—
Miyao, Hidehiko; Ikeda, Satoshi; Shiotsuki, Masao; Kawamura, Shigeyoshi; Komatsu, Fumiaki; Takagi, Ikuji; and Sakai, Tadamiti, 5,063,001, Cl. 264-0.500.

Takagi, Takeo: *See*—
Miura, Haruo; Fukushima, Yasuo; Nishida, Hideo; Kobayashi, Hiromi; and Takagi, Takeo, 5,062,766, Cl. 415-199.100.

Takaguchi, Hiroyuki, to Taiyo Seiki Iron Works Co., Ltd. Container coupling device. 5,062,752, Cl. 411-347.000.

Takahashi, Akihiko: *See*—
Takeshima, Akira; Asakura, Toshikazu; Takahashi, Akihiko; Kobayashi, Shigeo; and Hayashi, Shoichi, 5,062,491, Cl. 173-12.000.

Takahashi, Hiroshi: *See*—
Miyashita, Hiroshi; Hamamoto, Hideotoshi; Nagai, Shigeru; Yamaguchi, Makoto; Isao, Onuki; Takahashi, Hiroshi; and Ishiguro, Atsushi, 5,062,890, Cl. 106-27.000.

Takahashi, Hiroyuki, to NEC Corporation. Semiconductor memory circuit with diode load circuits. 5,063,540, Cl. 365-175.000.

Takahashi, Kaoru: *See*—
Ohsuga, Masaru; and Takahashi, Kaoru, 5,063,123, Cl. 429-38.000.

Takahashi, Keisuke: *See*—
Katsumata, Haruo; Sakai, Hiromichi; Takahashi, Keisuke; Ootaguro, Hirofumi; Matsumoto, Masashi; Nakamura, Moriyasu; and Ando, Tatsuo, 5,062,897, Cl. 106-696.000.

Takahashi, Kenji, to Sony Corporation. Disk cartridge. 5,063,558, Cl. 369-291.000.

Takahashi, Koji: *See*—
Ishikawa, Hisashi; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, 5,063,457, Cl. 358-330.000.

Takahashi, Masatoshi: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; and Nishikawa, Yasuo, 5,063,105, Cl. 428-336.000.

Takahashi, Sakae: *See*—
Hayashi, Minoru; Matsufuji, Mitoshi; Takahashi, Sakae; Kamiji, Koichi; Kobari, Kouichi; Kishimoto, Junichi; Shioda, Michio; and Kawaguchi, Masaaki, 5,062,367, Cl. 102-530.000.

Takahashi, Sunao: *See*—
Kawata, Yutaka; Inoue, Ken-ichi; Ishibashi, Kiyotaka; Kobayashi, Akira; Inoue, Koji; Suzuki, Norio; Arai, Akio; Yamada, Kaneo; Tokushige, Keizo; Fukuyama, Hirofumi; Adachi, Shigeto; Furukawa, Yukito; Takahashi, Sunao; and Kimura, Makoto, 5,063,294, Cl. 250-309.000.

Takahashi, Tatsuhiko: *See*—
Hasegawa, Akira; Mori, Hiroshi; Takahashi, Tatsuhiko; and Sano, Yasuyuki, 5,063,255, Cl. 522-96.000.

Takai, Haruki: *See*—
Nomoto, Yuji; Takai, Haruki; Ohno, Tetsuji; and Kubo, Kazuhiro, 5,063,227, Cl. 514-252.000.

Takai, Kazuhiko: *See*—
Shimizu, Shigemi; and Takai, Kazuhiko, 5,062,772, Cl. 417-269.000.

Takamatsu, Ryoji; Naitou, Osamu; Urushibata, Hiroyuki; and Sato, Masahiro, to Sony Corporation. Disc drive apparatus. 5,063,557, Cl. 369-219.000.

Takamori, Tetsuya, to Fuji Photo Film Co., Ltd. Method of and device for detecting an image area in an image processor. 5,063,606, Cl. 382-48.000.

Takamura, Toshiyuki; Kurihashi, Kazunari; and Harada, Masazumi, to Sanden Corporation. Automatic vending machine dispensing mechanism. 5,062,545, Cl. 221-152.000.

Takano, T.; Kosuga, Y.; and Sinzawa, K., to Daiichi Denso Buhin Co., Ltd. Waterproof and dustproof push switch. 5,063,277, Cl. 200-531.000.

Takata Corporation: *See*—
Satoh, Takeshi, 5,062,663, Cl. 280-743.000.

Takeda, Fumio; Yoshida, Takashi; Taguchi, Hiroya; Omine, Tsutomu; and Asano, Mitsugu, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Printing apparatus. 5,062,723, Cl. 400-120.000.

Takeda, Masaru: *See*—
Sawamura, Seishi; Nakajima, Sakuya; Amemori, Kunio; Oku, Hidehisa; Nakagawa, Akio; Kitayama, Ichiro; Matsuda, Hiromu; Yoshida, Katsuhiko; Takeda, Masaru; Nakane, Toshio; Horiguchi, Shiro; and Yuki, Shigeru, 5,062,856, Cl. 623-24.000.

Takeda, Masatoshi; Aritsuka, Tomohiko; and Tachibana, Yoshitaka, to Mitsubishi Denki Kabushiki Kaisha. Active filter device. 5,063,532, Cl. 364-825.000.

Takeda, Nobuhiro, to Canon Kabushiki Kaisha. Information processing apparatus having a common A/D converter for the image and audio signals. 5,063,447, Cl. 358-145.000.

Takeda, Yuji, to Toyota Jidosha Kabushiki Kaisha. Knocking control apparatus of internal combustion engine. 5,062,402, Cl. 123-425.000.

Takegahara, Takashi: *See*—
Seki, Masaki; Takegahara, Takashi; and Arakaki, Takeshi, 5,063,517, Cl. 364-474.220.

Takehara, Shin: *See*—
Edahiro, Takeshi; Takehara, Shin; Morita, Toshiki; and Kumada, Hiroyoshi, 5,062,659, Cl. 280-707.000.

Takei, Hisashi; Ohmura, Hiroshi; Ushiro, Seimei; Mochida, Mitsuyoshi; Nakamura, Yoshihiko; Asano, Seiji; and Yoshida, Toshio, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package. 5,063,400, Cl. 354-288.000.

Takemasa, Kazuo, to Sanyo Electric Co., Ltd. Refrigerant composition containing dichloromonofluoromethane. 5,062,985, Cl. 252-67.000.

Takemoto, Tetsuya: *See*—
Maeda, Takeshi; Kawaguchi, Hiroshi; Yamaguchi, Harukazu; Sakai, Hitoshi; Ando, Akio; Matsushita, Yasuo; and Takemoto, Tetsuya, 5,062,926, Cl. 202-183.000.

Takemura, Tohur: *See*—
Nozaki, Yoshihisa; Inden, Takashi; and Takemura, Tohur, 5,062,524, Cl. 198-465.400.

Takenaka, Toichi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, 5,063,246, Cl. 514-517.000.

Takeshima, Akira; Asakura, Toshikazu; Takahashi, Akihiko; Kobayashi, Shigeo; and Hayashi, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling nut runner. 5,062,491, Cl. 173-12.000.

Takeuchi, Hiroyuki: *See*—
Sato, Takeo; Yamamoto, Masaki; Aoki, Shinichiro; Sugiyama, Yoshiyuki; Nakanishi, Yoshito; and Takeuchi, Hiroyuki, 5,062,705, Cl. 356-124.000.

Takeuchi, Setsuyuki, to A.K. Technical Laboratory, Inc. Rotary type injection orientation blow molding machine. 5,062,787, Cl. 425-522.000.

Takigami, Machiko: *See*—
Arita, Yoshikazu; Iizuka, Toshi; Abe, Yukio; Nakamura, Yoshio; Takigami, Shoji; and Takigami, Machiko, 5,063,042, Cl. 423-447.400.

Takigami, Shoji: *See*—
Arita, Yoshikazu; Iizuka, Toshi; Abe, Yukio; Nakamura, Yoshio; Takigami, Shoji; and Takigami, Machiko, 5,063,042, Cl. 423-447.400.

Takimoto, Futoshi: *See*—
Kiyonari, Toshiyuki; Hirabayashi, Satoshi; Kidokoro, Naoto; and Takimoto, Futoshi, 5,063,137, Cl. 430-292.000.

Takita, Masatoshi; and Shimizu, Takaaki, to Shin-Etsu Chemical Co., Ltd. Synthetic silica glass article for dopant-diffusion process in semiconductors. 5,063,181, Cl. 501-54.000.

Takita, Yumiko: *See*—
Nishii, Yasuho; and Takita, Yumiko, 5,063,221, Cl. 514-167.000.

Tamaoka, Mie: *See*—
Cho, Hidetsura; Ueda, Masaru; Tamaoka, Mie; Hamaguchi, Mikiko; Murota, Seiitsu; and Morita, Ikuo, 5,063,243, Cl. 514-438.000.

Tanabe, Yoshihito: *See*—
Asaba, Eiki; Tanabe, Yoshihito; and Tagami, Kiyoshi, 5,063,295, Cl. 250-231.140.

Tanaka, Haruhiko: *See*—
Akimoto, Hajime; Ozaki, Toshifumi; Tokumasu, Kazuya; Ono, Hideyuki; and Tanaka, Haruhiko, 5,063,581, Cl. 377-58.000.

Tanaka, Hideaki; Hirata, Toichi; Sugiyama, Genroku; Haga, Masakazu; and Kajita, Yusuke, to Hitachi Construction Machinery Co., Ltd. Hydraulic drive system for civil Engineering and construction machine. 5,062,350, Cl. 91-448.000.

Tanaka, Hiroki; and Tsuchida, Shin, to Sumitomo Light Metal Industries, Ltd. Method of producing hardened aluminum alloy sheets having superior corrosion resistance. 5,062,901, Cl. 148-11.50A.

Tanaka, Kazuhide: *See*—
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, 5,063,200, Cl. 505-1.000.

Tanaka, Kouji, to Alps Electric Co., Ltd. Remote control unit. 5,063,484, Cl. 362-109.000.

Tanaka, Kunimaro: *See*—
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,063,546, Cl. 369-32.000.

Tanaka, Masaki: *See*—
Watanuki, Yoshio; Mochida, Haruo; Inoue, Masaru; Suzuki, Kazuya; and Tanaka, Masaki, 5,062,312, Cl. 74-89.140.

Tanaka, Mitsutoshi: *See*—
Arai, Fuminori; Igarashi, Takeshi; and Tanaka, Mitsutoshi, 5,063,153, Cl. 435-26.000.

Tanaka, Yutaka: *See*—
Nishizawa, Taiji; Tanaka, Yutaka; Gohshi, Seiichi; Kumada, Junji; Iwadate, Yuichi; Shibuya, Kazuhiko; Susaki, Toshihiko; Nishida, Yukihiro; Honda, Minoru; Kurita, Taiichiro; Izumi, Yoshinori; Okui, Makoto; Kondo, Isao; Yajima, Ryoichi; and Ishida, Jun'ichi, 5,063,445, Cl. 358-138.000.

Tanashin Denki Co., Ltd.: *See*—
Yoshimura, Toshio, 5,063,455, Cl. 360-96.500.

Tandai, Takahiko, to Nakamichi Corporation; and Nakamichi Fukushima Corporation. Composite magnetic head assembly having reduced cross feed between waiting and reading heads. 5,063,469, Cl. 360-128.000.

Tandy Electronics Japan, Ltd.: *See*—
Tsushima, Masayuki, 5,063,589, Cl. 379-82.000.

Taneda, Nobuo: *See*—
Mizutani, Shoji; and Taneda, Nobuo, 5,063,009, Cl. 264-49.000.

Tani, Shichisei: *See*—
Sagawa, Takayoshi; Tani, Shichisei; and Kato, Katsuo, 5,062,522, Cl. 198-400.000.

Tanigawa, Shu: *See*—
Okada, Kenichi; Nishino, Masashi; and Tanigawa, Shu, 5,062,710, Cl. 356-350.000.

Taniguchi, Hitofumi; and Kuramoto, Nobuyuki, to Tokuyama Soda Kabushiki Kaisha. Sinterable aluminum nitride composition, sintered body from this composition and process for producing the sintered body. 5,063,183, Cl. 501-96.000.

Taniguchi, Masao: *See*—
Sekiya, Tetsuo; Inoue, Shinya; Taniguchi, Masao; Umezu, Kohei; and Suzuki, Kazuo, 5,063,247, Cl. 514-585.000.

Tanimoto, Hideo: *See*—
Yamada, Yoshimi; Ito, Kazuo; and Tanimoto, Hideo, 5,063,508, Cl. 364-419.000.
Tanimoto, Yoshio: *See*—
Yamane, Takakazu; Tanimoto, Yoshio; and Nakahama, Tadamitsu, 5,063,085, Cl. 427-240.000.
Tanioka, Hiroshi: *See*—
Yanagisawa, Ryozo; Tanioka, Hiroshi; Kaneko, Kiyoshi; Harada, Toshiaki; Yoshikawa, Kikuo; Koumura, Noboru; and Inui, Toshiharu, 5,063,451, Cl. 346-143.000.
Tanita, Takeo; Kigami, Hiroyuki; and Azuma, Yusaku, to Canon Kabushiki Kaisha. Orthogonal two-axis moving apparatus. 5,063,334, Cl. 318-568.100.
Tateno, Manabu, to Toyota Jidosha Kabushiki Kaisha. Two-stroke internal combustion engine. 5,062,395, Cl. 123-65.0VD.
Tatsumi, Yoshikazu: *See*—
Freitas, Joseph D., Jr.; Tatsumi, Yoshikazu; and Furukawa, Hiroyuki, 5,063,298, Cl. 250-497.100.
Taylor, Ronald F.: *See*—
Reynolds, George, 5,062,814, Cl. 440-31.000.
TEAC Corporation: *See*—
Uehara, Keiji, 5,063,554, Cl. 369-77.200.
Tedesco, Raffaele; Busato, Giampaolo; and Sinatora, Giampaolo, to Montefibre S.p.A. Non-woven mat consisting of acrylic continuous filaments showing high modulus impregnated with an inorganic matrix. 5,063,099, Cl. 428-109.000.
Tegel, Anita, heir: *See*—
Tegel, Marek, deceased; and Wenzel, Dieter, 5,062,345, Cl. 89-1.817.
Tegel, Marek, deceased (by Tegel, Anita, heir); and Wenzel, Dieter, to DMT Marinetechnik GmbH. Cap for a rocket exit opening. 5,062,345, Cl. 89-1.817.
Teijin Limited: *See*—
Mizutani, Shoji; and Taneda, Nobuo, 5,063,009, Cl. 264-49.000.
Tektronix, Inc.: *See*—
Bateman, Glenn, 5,062,704, Cl. 356-73.100.
Teldix GmbH: *See*—
Carter, Robert E., 5,063,321, Cl. 310-323.000.
Telefonaktiebolaget L M Ericsson: *See*—
Jodoin, Dominique, 5,063,591, Cl. 379-115.000.
Roos, Sture G., 5,062,801, Cl. 439-61.000.
Temperley, Harry D.: *See*—
Parsons, David; Bainbridge, Wilfred N.; Young, Alastair J.; and Temperley, Harry D., 5,062,320, Cl. 74-650.000.
Tenenbaum, J. Martin: *See*—
Nishihara, H. Keith; Crossley, P. Anthony; Hunt, Neil D.; and Tenenbaum, J. Martin, 5,062,567, Cl. 228-105.000.
Terao, Kazuo: *See*—
Kubo, Tsutomu; Terao, Kazuo; Yamamuro, Takashi; Kajimoto, Masashi; and Tsukagoshi, Kazuhiko, 5,063,133, Cl. 430-122.000.
Terazi, Kazufumi: *See*—
Okamoto, Satoru; Terazi, Kazufumi; Nishino, Seiichi; and Bonkohara, Manabu, 5,063,435, Cl. 357-74.000.
Terracol, Claude; Bredel, Patrick; and Guillet, Jean-Laurent, to Merlin Gerin. Production machine incorporationg a high-speed lift and carry device with double walking beam, and the production system implementing this type of machine. 5,062,525, Cl. 198-468.600.
Teske, Reiner: *See*—
Roth, Siegfried; Benz, Detlef; Reichle, Anton; Teske, Reiner; Zimmermann, Peter; Hager, Peter; Mueller, Josef; and Poenitzsch, Werner, 5,062,589, Cl. 244-117.00R.
Texaco Inc.: *See*—
Migdal, Cyril A.; and Jenkins, Robert H., Jr., 5,062,980, Cl. 252-51.50A.
Texas Alkyls, Inc.: *See*—
Malpass, Dennis B.; and Wang, Bor-Ping E., 5,063,188, Cl. 502-116.000.
Texas Instruments Incorporated: *See*—
Chapoton, Charles W., 5,063,529, Cl. 364-571.020.
Gill, Manzur, 5,063,171, Cl. 437-41.000.
Iyengar, Narasimhan, 5,063,304, Cl. 307-296.600.
Theordorsen, Trygve: *See*—
Cholid, Yanbo; Theordorsen, Trygve; and Wilhelmi, Jurgen, 5,062,733, Cl. 403-189.000.
Thermo Electron Technologies Corporation: *See*—
Beaty, John S.; and Rolfe, Jonathan L., 5,062,936, Cl. 204-164.000.
Thiel, Klaus-Dieter: *See*—
Engel, Walter; Eisenreich, Norbert; and Thiel, Klaus-Dieter, 5,063,036, Cl. 423-266.000.
Thinesen, Tom, to Timex Corporation. Program to alter alarm setting in a multimode alarm timepiece. 5,063,544, Cl. 368-74.000.
Thiokol Corporation: *See*—
Canterberry, J. B.; and Flanigan, David A., 5,062,365, Cl. 102-322.000.
Myers, Robert I.; Brubaker, Bryce D.; and Overall, Robert E., 5,062,206, Cl. 29-890.010.
Thomas, Eugene R.: *See*—
Haut, Richard C.; Thomas, Eugene R.; and Denton, Robert D., 5,062,270, Cl. 62-12.000.
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., to SSI Medical Services, Inc. Bimodal turning method. 5,062,167, Cl. 5-61.000.
Thomas Jefferson University: *See*—
Galkin, Benjamin M., 5,063,583, Cl. 378-207.000.
Thompson, David F.: *See*—
Hampton, Leslie E.; and Thompson, David F., 5,062,911, Cl. 156-89.000.
Thompson, William L., to International Composites Corporation. Method for mounting and dismounting rigid sleeves onto and from a cylinder. 5,062,193, Cl. 29-426.600.
Thomson Consumer Electronics, Inc.: *See*—
Canfield, Barth A.; and Fling, Russell T., 5,063,580, Cl. 377-55.000.
Ragland, Frank R., Jr., 5,063,325, Cl. 313-405.000.
Thomson-CSF: *See*—
Bourdeau, Alain; and de Volder, Claude, 5,063,386, Cl. 342-40.000.
Colineau, Joseph; and Machui, Jurgen, 5,063,467, Cl. 360-119.000.
Coppier, Herve ; Pourailly, Jean-Louis; and Roger, Joseph, 5,063,363, Cl. 333-33.000.
Ferre, Alain; Chevance, Christophe; and Quignon, Jean, 5,063,524, Cl. 364-516.000.
Gault, Dominique; Andrieu, Jean-Pierre; and Henri, Jean-Claude, 5,063,388, Cl. 342-185.000.
Thorn Emi plc: *See*—
Linden-Smith, Neil A.; and Rowley, Andrew T., 5,063,333, Cl. 315-326.000.
Thornhill, Christopher J.: *See*—
Price, Barry L.; and Thornhill, Christopher J., 5,063,527, Cl. 364-550.000.
Thornock, Jeffery M.: *See*—
Arbanas, Glenn A.; Thornock, Jeffery M.; and Keate, Christopher R., 5,063,577, Cl. 375-120.000.
Thornton, Constance J.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Yanus, John F.; Limburg, William W.; and Mammino, Joseph, 5,063,125, Cl. 430-59.000.
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Mammino, Joseph; Yu, Robert C. U.; Hamilton, Vincent E.; Limburg, William W.; and Chen, Cindy, 5,063,128, Cl. 430-63.000.
Those Characters from Cleveland, Inc.: *See*—
Chanter, Edward G.; and Randleman, Randy J., 5,062,647, Cl. 273-442.000.
Tietjen, Marlene: *See*—
Verdon, Debra; Tietjen, Marlene; and Brown, Ivonne, 5,063,050, Cl. 424-63.000.
Tiffany, William B., to Coherent, Inc. Isotopic CO_2 laser and method of use for medical treatment. 5,062,842, Cl. 606-3.000.
Timex Corporation: *See*—
Thinesen, Tom, 5,063,544, Cl. 368-74.000.
Timmons, Robert W., to McDonnell Douglas Corporation. Corrugated air hose assembly. 5,062,457, Cl. 138-125.000.
Tinder, Richard F.; and Klaus, Richard I., to Washington State University Research Foundation, Inc. Microprogrammable asynchronous controllers for digital electronic systems. 5,063,536, Cl. 395-775.000.
Tipton, Craig D.: *See*—
Bayles, Frederick L., Jr.; Walsh, Reed H.; and Tipton, Craig D., 5,062,975, Cl. 252-33.000.
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, to Indiana Tube Corporation. Method and apparatus for forming bends in a tube. 5,062,288, Cl. 72-383.000.
Tobias, Jaromir. Hydrostatic power transfer system with isolating accumulator. 5,062,498, Cl. 180-308.000.
Tobiason, Timothy W., to Toby's Chemical Company. Method and apparatus for clearing flora from sewer lines. 5,062,878, Cl. 71-65.000.
Toby's Chemical Company: *See*—
Tobiason, Timothy W., 5,062,878, Cl. 71-65.000.
Toda, Kazuyuki: *See*—
Miyagawa, Naoomi; Yoshida, Chiyoaki; Toda, Kazuyuki; and Nakamura, Yukiyasu, 5,062,283, Cl. 72-10.000.
Tokumasu, Kazuya: *See*—
Akimoto, Hajime; Ozaki, Toshifumi; Tokumasu, Kazuya; Ono, Hideyuki; and Tanaka, Haruhiko, 5,063,581, Cl. 377-58.000.
Tokushige, Keizo: *See*—
Kawata, Yutaka; Inoue, Ken-ichi; Ishibashi, Kiyotaka; Kobayashi, Akira; Inoue, Koji; Suzuki, Norio; Arai, Akio; Yamada, Kaneo; Tokushige, Keizo; Fukuyama, Hirofumi; Adachi, Shigeto; Furukawa, Yukito; Takahashi, Sunao; and Kimura, Makoto, 5,063,294, Cl. 250-309.000.
Tokuyama Soda Kabushiki Kaisha: *See*—
Taniguchi, Hitofumi; and Kuramoto, Nobuyuki, 5,063,183, Cl. 501-96.000.
Tokyo Electric Co., Ltd.: *See*—
Nuita, Akira; and Kawaguchi, Katsuhiko, 5,063,395, Cl. 346-76.0PH.
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, 5,062,722, Cl. 400-120.000.
Tokyo Tanabe Company: *See*—
Yazaki, Takashi; Matsushita, Tomohisa; and Nagase, Tsutomu, 5,063,061, Cl. 424-427.000.
Tolson, Sidney S., to Ossid Corporation. Selective sequential shrink apparatus and process. 5,062,217, Cl. 34-22.000.
Tomii, Hiroyasu; and Kaneko, Yukio, to Nippon Piston Ring Co., Ltd.; and Kay Seven Co., Ltd. Universal joint. 5,062,730, Cl. 403-57.000.
Tominaga, Kazutoshi, to Kabushiki Kaisha Tominaga Jyushi Kobyosho. Filtering device for household aquariums. 5,062,951, Cl. 210-169.000.
Tomio, Minaki: *See*—
Yamada, Yasuhiko; Tomio, Minaki; Miyamae, Toshiyuki; and Kawai, Norio, 5,062,618, Cl. 267-140.400.

Tomioka, Kentaro: *See*—
Akahane, Shoji; Tosaki, Satoshi; Kusayanagi, Yukiharu; Kusakai, Shigenobu; Hirota, Kazuo; and Tomioka, Kentaro, 5,063,257, Cl. 523-116.000.

Tomita, Akira; Diaz, Stephen H.; Dubrow, Robert S.; and Feldman, Michael, to Raychem Corporation. Method for making an optical fiber coating dispenser package. 5,062,254, Cl. 53-467.000.

Tomita, Kunikazu: *See*—
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,062,906, Cl. 148-111.000.

Tomita, Yukio; Yamaba, Ryota; and Kumagai, Tatsuya, to Nippon Steel Corporation, a. Method of producing non-oriented magnetic steel plate having high magnetic flux density. 5,062,905, Cl. 148-111.000.

Tomiyama, Shigeo: *See*—
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, 5,062,771, Cl. 417-201.000.

Tomotake, Atsushi: *See*—
Sugita, Shuichi; Mizukura, Noboru; Kohno, Junichi; Kadokura, Kenzi; and Tomotake, Atsushi, 5,063,148, Cl. 430-551.000.

Tompkins, Dale A.; and Sicka, Richard W., to Bridgestone/Firestone, Inc. Coextrusion apparatus for varying the inner and/or outer profile of a tubular extrudate. 5,062,782, Cl. 425-113.000.

Tonutti, Carletto, to Tonutti S.p.A. Pull type bifold hay rake. 5,062,260, Cl. 56-380.000.

Tonutti S.p.A.: *See*—
Tonutti, Carletto, 5,062,260, Cl. 56-380.000.

Toomey, John C., to Medex, Inc. Freeze-dried blood gas sensor. 5,063,178, Cl. 422-82.070.

Toray Industries, Inc.: *See*—
Hirota, Kusato; Ohbayashi, Gentaro; and Nakanishi, Toshiharu, 5,063,097, Cl. 428-65.000.
Oka, Mitsuko; and Okumura, Yoshiharu, 5,062,158, Cl. 2-46.000.

Toriuchi, Masaharu; and Kondo, Hirokazu, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic light-sensitive material. 5,063,135, Cl. 430-214.000.

Tosaki, Satoshi: *See*—
Akahane, Shoji; Tosaki, Satoshi; Kusayanagi, Yukiharu; Kusakai, Shigenobu; Hirota, Kazuo; and Tomioka, Kentaro, 5,063,257, Cl. 523-116.000.

Toshiba Ceramics Co., Ltd.: *See*—
Sakai, Hiroshi; Asai, Masamichi; Hayashi, Kenzo; Sakurai, Kazunori; and Watanabe, Kazuhiko, 5,062,554, Cl. 222-600.000.

Toy, William O., Jr.: *See*—
Titzer, Keith; Oran, Charlie; Reich, Richard; Gann, Gary; Toy, William O., Jr.; Lamb, Jerry; Brack, Chris; Comer, Lloyd; Libbert, Dan; Masterson, Don; Shekell, Jerry; Deig, Don; Butler, Kenneth; and Roehm, Earl, 5,062,288, Cl. 72-383.000.

Toyo Tire & Rubber Co., Ltd.: *See*—
Yamada, Yasuhiko; Tomio, Minaki; Miyamae, Toshiyuki; and Kawai, Norio, 5,062,618, Cl. 267-140.400.

Toyoda Koki Kabushiki Kaisha: *See*—
Sugita, Kazuhiko; Hori, Nohumitsu; and Nakane, Yasumasa, 5,063,322, Cl. 310-341.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Takeda, Yuji, 5,062,402, Cl. 123-425.000.
Tateno, Manabu, 5,062,395, Cl. 123-65.0VD.

Trace, Adrian L.; and Basten, Mark J., to Lucas Industries. Processing circuit for optical combustion monitor. 5,063,287, Cl. 250-214.0AG.

Tran, Thanh: *See*—
Ulbrich, Paul; and Tran, Thanh, 5,062,426, Cl. 128-640.000.

Transitions Research Corporation: *See*—
Weiman, Carl F. R., 5,063,604, Cl. 382-41.000.

Transport Technology Corporation: *See*—
Samaniego, Felix, 5,062,760, Cl. 414-542.000.

Trautmann, Guenther H.; and Link, Helmut F., to Index-Werke Komm.-Ges. Hahn & Tessky. Machine tool with a cooled motor spindle. 5,062,330, Cl. 82-147.000.

Treharne, Richard: *See*—
Jamison, Russell D.; Brumfield, David; and Treharne, Richard, 5,062,844, Cl. 606-54.000.

Tremblay, Michel, deceased (by Paquet, Francine, heiress), to Gestion A. et Y. Gilbert Inc. Anchoring device for light boat. 5,062,376, Cl. 114-230.000.

Tremblay, Pierre: *See*—
Hudson, Tom J.; McIntyre, John; Tremblay, Pierre; Allaire, Claude; and Gnyra, Bohdan, 5,062,929, Cl. 204-67.000.

Tri-Way Machine Ltd.: *See*—
Jones, Joel W.; and Eldracher, John, 5,062,188, Cl. 29-33.00P.

Trillwood, Richard E., to Wentgate Dynaweld, Inc. Shuttle system for rapidly manipulating a workpiece into and out of an atmospherically controlled chamber for doing work thereon in the chamber. 5,062,758, Cl. 414-217.000.

Tristani-Kendra, Miguel G.; and Papapolymerou, George, to Minnesota Mining and Manufacturing Company. Liquid crystal device with grey scale. 5,062,691, Cl. 359-56.000.

Tritchler, Robert W.: *See*—
Rankin, Russel J.; de Chastel, David J., deceased; Wescombe, Graeme L.; Kerr, David T.; Boyce, Phillip R.; White, Raymond M.; Tritchler, Robert W.; and Buhot, John W., 5,062,820, Cl. 452-187.000.

Triten Corporation: *See*—
Junier, Marius R., 5,062,445, Cl. 137-340.000.

Truckai, Csaba: *See*—
Fontirroche, Carlos A.; and Truckai, Csaba, 5,063,018, Cl. 264-514.000.

Trueheart, Joshua: *See*—
Fink, Gerald R.; Trueheart, Joshua; and Elion, Elaine A., 5,063,154, Cl. 435-69.100.

TRW Inc.: *See*—
Botez, Dan; Mawst, Luke J.; and Peterson, Gary L., 5,063,570, Cl. 372-50.000.

Tsai, Huang S., to Tung Keng Col, Ltd.; and Tung Keng Col, Ltd. Rotatable hanger assembly. 5,062,536, Cl. 211-162.000.

Tse, Kam Y.; and Wong, Leonard J. Number generating device with magnetic biasing means. 5,062,635, Cl. 273-144.00A.

Tsoi, Paul Y., to Com Dev Ltd. C-, T- and S-switches that are mechanically operated by a rotary actuator. 5,063,364, Cl. 333-107.000.

Tsuchida, Shin: *See*—
Tanaka, Hiroki; and Tsuchida, Shin, 5,062,901, Cl. 148-11.50A.

Tsuchida, Tsuyoshi: *See*—
Fukada, Hirotaka; Kondoh, Koichi; and Tsuchida, Tsuyoshi, 5,062,496, Cl. 180-291.000.

Tsuchiya, Ikuo: *See*—
Matsuo, Kenji; Nonaka, Tadashi; and Tsuchiya, Ikuo, 5,063,433, Cl. 357-71.000.

Tsuchiya, Teruyuki: *See*—
Hasegawa, Yoshitomo; and Tsuchiya, Teruyuki, 5,062,864, Cl. 55-495.000.

Tsuda, Shigenori: *See*—
Ohtsubo, Toshiro; Tsuda, Shigenori; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 5,063,059, Cl. 424-408.000.

Tsuda, Youichirou: *See*—
Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, 5,063,551, Cl. 369-48.000.

Tsuge, Kazuto; Hattori, Masateru; Kondo, Kazuo; and Shibata, Yoshimasa, to NGK Spark Plug Co., Ltd. SiC based artificial dental implant. 5,062,798, Cl. 433-201.100.

Tsui, Yu-Ming: *See*—
Sheu, Shyh-Her; and Tsui, Yu-Ming, 5,062,700, Cl. 359-508.000.

Tsuji, Kenji: *See*—
Shimada, Takahisa; Yamaki, Toshio; Tsuji, Kenji; Nakai, Masaaki; Fujino, Akihiko; and Ootsuka, Hiroshi, 5,063,402, Cl. 354-400.000.

Tsuji, Kozo: *See*—
Ohtsubo, Toshiro; Tsuda, Shigenori; Kawada, Hitoshi; Shinjo, Goro; and Tsuji, Kozo, 5,063,059, Cl. 424-408.000.

Tsujimura, Manabu: *See*—
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 5,062,271, Cl. 62-55.500.

Tsukagoshi, Kazuhiko: *See*—
Kubo, Tsutomu; Terao, Kazuo; Yamamuro, Takashi; Kajimoto, Masashi; and Tsukagoshi, Kazuhiko, 5,063,133, Cl. 430-122.000.

Tsushima, Masayuki, to Tandy Electronics Japan, Ltd. Automatic telephone answering machine with ring signal responsive mode changing arrangement. 5,063,589, Cl. 379-82.000.

Tsuyoshi, Hagio; Kobayashi, Kazuo; Yoshida, Hisayoshi; Ogawa, Ichitaro; Harada, Hiroshi; Yasunaga, Hiroaki; and Nishikawa, Hiroshi, to Agency of Industrial Science and Technology; and Denki Kagaku Kogyo Kabushiki Kaisha. Pressureless sintered body of boron nitride. 5,063,184, Cl. 501-96.000.

Tu, Ching-Chuan. Side rails fastening mechanism for telescopic aluminum step ladders. 5,062,499, Cl. 182-166.000.

Tubb, Joe W.: *See*—
Lindsey, James D.; Hutton, Charles D.; Tubb, Joe W.; Shipman, Carol L.; and Kyle, Albert S., III, 5,063,507, Cl. 364-408.000.

Tucker, Annabelle D. Expansible internal pressure cold packs and perineal ice pad. 5,062,425, Cl. 128-401.000.

Tully, John W.; O'Brien, Benedict B.; Hant, William; and Hu, King L., to Northrop Corporation. Planar bipolar transistors including heterojunction transistors. 5,063,427, Cl. 357-35.000.

Tully, Wilfred R.: *See*—
Fenske, Dankwart C.; Kuo, Elizabeth A.; and Tully, Wilfred R., 5,063,229, Cl. 514-258.000.

Tung Keng Col, Ltd.: *See*—
Tsai, Huang S., 5,062,536, Cl. 211-162.000.
Tsai, Huang S., 5,062,536, Cl. 211-162.000.

Turcotte, David E.; and Coker, Daniel E., to BASF Corporation. Cooling system cleaning solutions. 5,062,987, Cl. 252-156.000.

Turkevich, Leonid A.; and Choi, Kee-Ju, to Standard Oil Company, The. Noninvasive method and apparatus using coherent backscattering for process control. 5,063,301, Cl. 250-574.000.

Tyagi, Dinesh: *See*—
Pierce, Zona R.; Tyagi, Dinesh; and Wilson, John C., 5,063,132, Cl. 430-109.000.

Tyler, Johann U.: *See*—
Geller, Bernard D.; Tyler, Johann U.; Holdeman, Louis B.; Phelleps, Fred R.; and Laird, George F., III, 5,063,177, Cl. 437-209.000.

TZN Forschungs, und Entwicklungszentrum Unterluss GmbH: *See*—
Neff, Franz H.; and Heinrich, Jurgen, 5,062,584, Cl. 244-3.150.

U-Haul International, Inc.: *See*—
Galbo, Vincent J., 5,062,541, Cl. 220-212.000.

Uchida, Norimasa, to Hitachi Metals, Ltd. Wire for dot printer. 5,063,116, Cl. 428-606.000.

Uchiyama, Kaneastu: *See*—
Inomata, Mitsugu; Nakao, Fumio; Maekawa, Takashi; Uchiyama, Kaneastu; Endo, Tetsu; Nobue, Kazuo; Shimazaki, Masaki; and Idouji, Shigeki, 5,062,726, Cl. 400-630.000.

Uda, Koji: *See*—
Mori, Tetsuzo; Sakamoto, Eiji; Hara, Shinichi; Uda, Koji; Shimoda, Isamu; Uzawa, Shunichi; and Ozawa, Kunitaka, 5,063,582, Cl. 378-34.000.

Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Steel laminate gasket with wide sealing area. 5,062,649, Cl. 277-235.00B.

Ueda, Katsunobu: *See*—
Sakuta, Shigeru; and Ueda, Katsunobu, 5,062,712, Cl. 356-400.000.

Ueda, Masaru: *See*—
Cho, Hidetsura; Ueda, Masaru; Tamaoka, Mie; Hamaguchi, Mikiko; Murota, Seiitsu; and Morita, Ikuo, 5,063,243, Cl. 514-438.000.

Ueda, Shinjiroo: *See*—
Satou, Akihiko; Kusaka, Tadao; Tomiyama, Shigeo; Aoki, Kouzi; Gyobu, Ichiro; Muramatsu, Kimio; Sakamoto, Hiroaki; Ueda, Shinjiroo; Mase, Masahiro; and Nagaoka, Takashi, 5,062,771, Cl. 417-201.000.

Ueda, Toshihiko: *See*—
Shiokawa, Shoko; Matsui, Yoshikazu; and Ueda, Toshihiko, 5,063,396, Cl. 346-140.00R.

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Barbu, Stephane; and Le Pailleur, Laurent, 5,063,312, Cl. 307-603.000.
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Buschow, Kurt H. J.; de Mooij, Dirk B.; and Jacobs, Theodora H., 5,062,907, Cl. 148-301.000.
Custers, Pieter H.; and Stulens, Ludo M. J., 5,063,547, Cl. 369-32.000.
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van Groningen, Wilhelmus D. H.; and Caris, Hubertus A., 5,063,302, Cl. 307-271.000.
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Falcoff, Monte L., 5,062,559, Cl. 224-311.000.

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Dunwoody, Andrew B., 5,062,268, Cl. 60-533.000.
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Liang, Dong C.; and Blades, Michael W., 5,062,708, Cl. 356-316.000.

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Siegel, Ronald A., 5,062,841, Cl. 604-891.100.
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Bazer, Fuller W., 5,063,226, Cl. 514-251.000.
Jaeger, Marc J., 5,062,471, Cl. 165-8.000.
MacMillan, Michael; and Haid, Regis, Jr., 5,062,850, Cl. 623-17.000.

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Rich, Arthur; and Van House, James C., 5,063,293, Cl. 250-308.000.

University of North Carolina at Chapel Hill, The: *See*—
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University of Penn., The Trustees of the: *See*—
Jaggard, Dwight L.; and Engheta, Nader, 5,063,391, Cl. 343-703.000.

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Potier, Michel; and Briet, Gilles, 5,062,478, Cl. 165-178.000.

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Finlayson, Roger M.; Scharmann, Harry; and Vermaas, Leo F., 5,063,076, Cl. 426-602.000.

Van Buskirk, Robert S.; and Clappier, Robert R., to Endotherapeutics. Urine collection monitor with temperature sensing. 5,062,304, Cl. 73-861.000.

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Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; and Wieck, Henry J., 5,063,081, Cl. 427-2.000.

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De Gier, Gertrudis M. G.; and Sytstra, Jan R., 5,062,227, Cl. 37-117.500.

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Victor, Keith R.: *See*—
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Vifian, Hugo: *See*—
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Kohl, Gretchen S.; Giwa-Agbomeirele, Patricia A.; and Vincent, Judith M., 5,063,044, Cl. 424-70.000.

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Viskase Corporation: *See*—
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Leondaridis, Paul S.; Von Drasek, William A.; and Jursich, Gregory M., 5,063,035, Cl. 423-241.000.

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Vrzalik, John H., to Kinetic Concepts, Inc. Patient support air bags and related system with connectors for detachable mounting of the bags. 5,062,171, Cl. 5-455.000.

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Malpass, Dennis B.; and Wang, Bor-Ping E., 5,063,188, Cl. 502-116.000.

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Horwell, David C.; and Rees, David C., 5,063,242, Cl. 514-414.000.

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Falcoff, Allan F.; and West, Norman M., 5,062,298, Cl. 73-597.000.

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Efferding, Larry E., 5,063,299, Cl. 250-507.100.
Vale, Christopher R.; Dominick, Thomas S.; Via, William R.; and Knapp, Gene P., Sr., 5,063,358, Cl. 331-60.000.

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Fink, Gerald R.; Trueheart, Joshua; and Elion, Elaine A., 5,063,154, Cl. 435-69.100.

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Conlan, John T.; and Whitekettle, Wilson K., 5,063,248, Cl. 514-665.000.
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Whitesel, J. Warren; and Cooper, Larry, to Middleby Corporation. Charbroiler. 5,062,408, Cl. 126-41.00R.

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Adamic, Raymond J.; Wickramanayake, Palitha; Hindagolla, Suraj L.; Radke, Garold E.; and Halko, David J., 5,062,893, Cl. 106-22.000.

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Fabry, Ehrenfried; Goddard, Georg; Meyer, Dieter; Petermann, Hans; Pirkl, Bernhard; and Wiedemann, Werner, 5,063,379, Cl. 340-784.000.

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Wild, Gene M.: *See*—
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Plath, Peter; Eicken, Karl; Goetz, Norbert; Wild, Jochen; Meyer, Norbert; and Wuerzer, Bruno, 5,062,884, Cl. 71-95.000.

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Williams, Roger D., to Pneumafil Corporation. Air filter with horizontal filter elements. 5,062,872, Cl. 55-302.000.

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Pierce, Zona R.; Tyagi, Dinesh; and Wilson, John C., 5,063,132, Cl. 430-109.000.

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Winters, Ralph A., to Intellisystems, Inc. Multi-user, artificial intelligent expert system. 5,063,522, Cl. 395-51.000.

Wirtz, John W.; Yanik, David; Rader, Robert R.; Mendoza, Roel; and Essig, Dennis E., to Wirtz Manufacturing Company, Inc. Battery plate stacker method. 5,062,762, Cl. 414-786.000.

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Wolcott, Herbert A., II: *See*—
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Wolf, Klaus D.: *See*—
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Wolfe, Henry L.: *See*—
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Wong, Leonard J.: *See*—
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Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., to Hewlett-Packard Company. Method and apparatus for measuring the length of, or distances to discontinuities in, an optical transmission medium. 5,062,703, Cl. 356-73.100.

Wong-Stahl, Flossie; Chanda, Pranab K.; and Ghrayeb, John, to United States of America, Health & Human Services. Isolation and purification of the R18 antigen of HTLV-III. 5,063,053, Cl. 424-89.000.

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Woodard, Tony O., to Eaton Corporation. Pushbutton switch with rotational contact wiping action. 5,063,276, Cl. 200-529.000.

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Guss, Robert J., III, 5,062,807, Cl. 439-490.000.

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Smith, David A.; and Woody, Clark M., 5,062,549, Cl. 222-377.000.
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Brown, Derek A.; Worth, John N.; and Santaniello, Brian F., 5,062,711, Cl. 356-394.000.

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Plath, Peter; Eicken, Karl; Goetz, Norbert; Wild, Jochen; Meyer, Norbert; and Wuerzer, Bruno, 5,062,884, Cl. 71-95.000.
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Carduck, Franz-Josef; Wuest, Willi; Harth, Hubert; and Liebs, Harald, 5,062,997, Cl. 260-400.000.

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James, Paul; Kuemmel, Theodore J.; Wurm, Michael G.; Banach, James D.; and Fulton, David, 5,062,432, Cl. 128-736.000.

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Wynn, David K.: *See*—
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Brueggemann, Harry P., 5,063,292, Cl. 250-236.000.
Domoto, Gerald A.; and Sereny, Aron, 5,063,413, Cl. 355-296.000.
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Kress, Glenn F.; and Coy, Gerald L., 5,062,602, Cl. 271-104.000.
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Yagi, Toshihiko: *See*—
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Kikuda, Shigeru; Miyamoto, Hiroshi; and Yamada, Michihiro, 5,063,313, Cl. 307-605.000.

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Murakami, Hiroshi; and Yamagata, Kazuko, 5,063,192, Cl. 502-303.000.

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Hoshino, Akira; Saji, Mikio; and Yamaguchi, Isamu, 5,063,256, Cl. 523-102.000.

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Kobayashi, Noboru, 5,062,815, Cl. 440-41.000.
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Yamamoto, Haruhisa; Urata, Hidenobu; Kinebuchi, Tatsuo; and Sawabe, Hidenori, to Nippon Zeon Co., Ltd. Magnetic powder for magnetic recording media. 5,062,982, Cl. 252-62.570.

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Shigeno, Yoshiharu; Murata, Michihiro; Nishino, Yu; Fukui, Norio; and Yamamoto, Keizou, 5,063,347, Cl. 324-235.000.

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Yamamoto, Mayjue A., to General Motors Corporation. Drum brake assembly having parking brake actuator adjuster with automatic brake adjustment during the service braking mode of operation. 5,062,504, Cl. 188-79.560.

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Kubo, Tsutomu; Terao, Kazuo; Yamamuro, Takashi; Kajimoto, Masashi; and Tsukagoshi, Kazuhiko, 5,063,133, Cl. 430-122.000.

Yamane, Takakazu; Tanimoto, Yoshio; and Nakahama, Tadamitsu, to Mazda Motor Corporation. Coating method. 5,063,085, Cl. 427-240.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; Takenaka, Toichi; and Honda, Kazuo, 5,063,246, Cl. 514-517.000.

Yamasaki, Richard G., to Silicon Systems, Inc. High frequency continuous time filter. 5,063,309, Cl. 307-521.000.

Yamashita, Hiroshi; and Doi, Akihiko, to Kabushiki Kaisha Toshiba. Information processing apparatus. 5,063,548, Cl. 369-44.140.

Yamashita, Shinichi: *See*—
Yoshimura, Katsuji; Aoki, Akio; Shimokoriyama, Makoto; Kashida, Motokazu; Yamashita, Shinichi; and Nagasawa, Kenichi, 5,063,453, Cl. 360-32.000.

Yamashita, Tatsumaro, to Alps Electric Co., Ltd. Rotary head type magnetic recording and reproducing apparatus. 5,063,466, Cl. 360-107.000.

Yamato, Motoyuki: *See*—
Sugawara, Tomoo; and Yamato, Motoyuki, 5,063,103, Cl. 428-285.000.

Yamato Scale Company, Limited: *See*—
Inoue, Shinichi, 5,062,492, Cl. 177-25.140.

Yamauchi, Yoshimitsu; and Sakiyama, Keizo, to Sharp Kabushiki Kaisha. Semiconductor memory device with capacitor over non-volatile memory cell gate structure. 5,063,425, Cl. 357-23.600.

Yamazaki Mazak Kabushiki Kaisha: *See*—
Miyagawa, Naoomi; Yoshida, Chiyoaki; Toda, Kazuyuki; and Nakamura, Yukiyasu, 5,062,283, Cl. 72-10.000.

Yamazaki, Toshimasa, to Maeda Industries, Ltd. Bicycle gear crank assembly. 5,062,318, Cl. 74-594.200.

Yanagisawa, Ryozo; Tanioka, Hiroshi; Kaneko, Kiyoshi; Harada, Toshiaki; Yoshikawa, Kikuo; Koumura, Noboru; and Inui, Toshiharu, to Canon Kabushiki Kaisha. Hand held recording apparatus with window on lower body portion for viewing recording position. 5,063,451, Cl. 346-143.000.

Yanai, Yoshimi: *See*—
Okada, Michiya; Morimoto, Tadaoki; Okayama, Akira; Yanai, Yoshimi; Satoh, Hiroshi; Matsumoto, Toshimi; Chiba, Yoshiteru; Akahori, Kimihiko; Kato, Takahiko; Doi, Toshiya; and Tanaka, Kazuhide, 5,063,200, Cl. 505-1.000.

Yanik, David: *See*—
Wirtz, John W.; Yanik, David; Rader, Robert R.; Mendoza, Roel; and Essig, Dennis E., 5,062,762, Cl. 414-786.000.

Yanus, John F.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Yanus, John F.; Limburg, William W.; and Mammino, Joseph, 5,063,125, Cl. 430-59.000.

Yarger, Ronald G.; Klemann, Lawrence P.; and Finley, John W., to Nabisco Brands, Inc. Amide ether derivatives as low calorie fat mimetics. 5,063,075, Cl. 426-601.000.

Yarovoi, Alexandr A.: *See*—
Aleshin, Nikolai P.; Baranov, Vladimir J.; Dolgov, Vyacheslav M.; Yarovoi, Alexandr A.; and Preobrazhensky, Oleg A., 5,062,301, Cl. 73-629.000.

Yasuda, Sigeru: *See*—
Watari, Haruo; and Yasuda, Sigeru, 5,063,550, Cl. 369-44.360.

Yasuma, Jun-ichi: *See*—
Ichihashi, Koji; and Yasuma, Jun-ichi, 5,062,454, Cl. 137-625.610.

Yasunaga, Hiroaki: *See*—
Tsuyoshi, Hagio; Kobayashi, Kazuo; Yoshida, Hisayoshi; Ogawa, Ichitaro; Harada, Hiroshi; Yasunaga, Hiroaki; and Nishikawa, Hiroshi, 5,063,184, Cl. 501-96.000.

Yatsu, Kenji: *See*—
Suzuki, Shoji; and Yatsu, Kenji, 5,063,553, Cl. 369-77.100.

Yazaki, Takashi; Matsushita, Tomohisa; and Nagase, Tsutomu, to Tokyo Tanabe Company. Aqueous preparation of pyrido(1,2-a)pyrimidine compound. 5,063,061, Cl. 424-427.000.

Yeda Research and Development Co., Ltd.: *See*—
Revel, Michel; and Chebath, Judith, 5,063,159, Cl. 435-252.300.

Yeomans, James S.: *See*—
Goldthorp, Jeffery M.; and Yeomans, James S., 5,063,351, Cl. 324-628.000.

Yerbury, Michael J.; and Hurst, Gregory C., to Advanced Systems Research Pty. Limited. Spread-spectrum multiplexed transmission system. 5,063,560, Cl. 370-18.000.

Yoda, Haruo; Miyatake, Takafumi; and Matsushima, Hitoshi, to Hitachi, Ltd. Motion control apparatus with function to self-form a series of motions. 5,063,492, Cl. 364-167.010.

Yoden, Kenichi, to Fuji Photo Film Co., Ltd. Treatment of ferromagnetic metal powders and magnetic recording media using the same. 5,062,904, Cl. 148-105.000.

Yokohama Rubber Co., Ltd., The: *See*—
Noguchi, Makoto, 5,062,461, Cl. 152-209.00R.

Yokomachi, Naoya: *See*—
Kawai, Katsunori; Ikeda, Hayato; Yokomachi, Naoya; and Kawai, Toshihiro, 5,062,773, Cl. 417-269.000.

Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Iida, Yoshikazu; Sakamoto, Hiroshi; and Matsui, Hideki, to Nikon Corporation. Electronic flash apparatus for camera. 5,063,403, Cl. 354-413.000.

Yokota, Kazunori: *See*—
Gotoh, Shigeyuki; Yokota, Kazunori; and Suzuki, Isao, 5,062,306, Cl. 73-862.330.

Yokotani, Kenji: *See*—
Nakajima, Masato; Yokotani, Kenji; and Ikeda, Atsushi, 5,062,922, Cl. 162-158.000.

Yokoya, Hiroaki; Tachikawa, Hiromichi; and Watarai, Syu, to Fuji Photo Film Co., Ltd. Electrophotographic printing plate precursor. 5,063,129, Cl. 430-83.000.

Yokoyama, Tomoaki: *See*—
Oka, Tateki; and Yokoyama, Tomoaki, 5,063,127, Cl. 430-45.000.

Yoneyama, Masakazu; Yamada, Ryosuke; Nishiura, Yosuke; Maekawa, Yukio; Higaki, Yuzo; and Iwamoto, Yoshiaki, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material containing aliphatic carboxylic ester. 5,063,147, Cl. 430-523.000.

Yoon, Seok G.; and Seo, Jeong Y. Lumber door and method for manufacturing thereof. 5,062,915, Cl. 156-252.000.

Yoshida, Chiyoaki: *See*—
Miyagawa, Naoomi; Yoshida, Chiyoaki; Toda, Kazuyuki; and Nakamura, Yukiyasu, 5,062,283, Cl. 72-10.000.

Yoshida, Hisayoshi: *See*—
Tsuyoshi, Hagio; Kobayashi, Kazuo; Yoshida, Hisayoshi; Ogawa, Ichitaro; Harada, Hiroshi; Yasunaga, Hiroaki; and Nishikawa, Hiroshi, 5,063,184, Cl. 501-96.000.

Yoshida, Katsuhiko: *See*—
Sawamura, Seishi; Nakajima, Sakuya; Amemori, Kunio; Oku, Hidehisa; Nakagawa, Akio; Kitayama, Ichiro; Matsuda, Hiromu; Yoshida, Katsuhiko; Takeda, Masaru; Nakane, Toshio; Horiguchi, Shiro; and Yuki, Shigeru, 5,062,856, Cl. 623-24.000.

Yoshida, Takashi: *See*—
Takeda, Fumio; Yoshida, Takashi; Taguchi, Hiroya; Omine, Tsutomu; and Asano, Mitsugu, 5,062,723, Cl. 400-120.000.

Yoshida, Toshio: *See*—
Takei, Hisashi; Ohmura, Hiroshi; Ushiro, Seimei; Mochida, Mitsuyoshi; Nakamura, Yoshihiko; Asano, Seiji; and Yoshida, Toshio, 5,063,400, Cl. 354-288.000.

Yoshigai, Kenichi, to Yoshigai Kikai Kinzoku Co., Ltd. Device for preventing disengagement of an inner wire of a Bowden cable from a bicycle brake operating lever. 5,062,315, Cl. 74-502.200.

Yoshigai Kikai Kinzoku Co., Ltd.: *See*—
Yoshigai, Kenichi, 5,062,315, Cl. 74-502.200.

Yoshikawa, Kikuo: *See*—
Yanagisawa, Ryozo; Tanioka, Hiroshi; Kaneko, Kiyoshi; Harada, Toshiaki; Yoshikawa, Kikuo; Koumura, Noboru; and Inui, Toshiharu, 5,063,451, Cl. 346-143.000.

Yoshimatsu, Hideaki, to Kabushiki Kaisha Kobe Seiko Sho. Slewing control device for crane. 5,062,266, Cl. 60-466.000.

Yoshimoto, Kyosuke: *See*—
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,063,546, Cl. 369-32.000.

Yoshimura, Katsuji; Aoki, Akio; Shimokoriyama, Makoto; Kashida, Motokazu; Yamashita, Shinichi; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Digital signal recording apparatus. 5,063,453, Cl. 360-32.000.

Yoshimura, Katsuji: *See*—
Ishikawa, Hisashi; Kozuki, Susumu; Takahashi, Koji; and Yoshimura, Katsuji, 5,063,457, Cl. 358-330.000.

Yoshimura, Toshio, to Tanashin Denki Co., Ltd. Mode selecting mechanism for a tape recorder. 5,063,455, Cl. 360-96.500.

Yoshino Kogyosho Co., Ltd.: *See*—
Hayashi, Yoshiaki, 5,062,537, Cl. 215-12.100.

Yoshio, Junichi; Hosaka, Sumio; Matsuoka, Hisao; Tsuda, Youichirou; Katagiri, Shoichi; and Nomura, Satoru, to Pioneer Electronic Corporation; and Pioneer Video Corporation. Method and apparatus of recording and reproducing picture information and recording medium. 5,063,551, Cl. 369-48.000.

Young, Alastair J.: *See*—
Parsons, David; Bainbridge, Wilfred N.; Young, Alastair J.; and Temperley, Harry D., 5,062,320, Cl. 74-650.000.

Young, Donald G., to Exxon Chemical Patents Inc. Composition for tire treads (E-235). 5,063,268, Cl. 524-286.000.

Young, James R.: *See*—
Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; and Nishi, Hisami, 5,063,602, Cl. 382-32.000.

Young, Wayne P.: *See*—
Green, David T.; Young, Wayne P.; Bolanos, Henry; Geiste, Robert J.; Ratcliff, Keith; and Alesi, Daniel E., 5,062,563, Cl. 227-176.000.

Youssefyeh, Raymond D.: *See*—
Pelletier, Jeffrey C.; Youssefyeh, Raymond D.; and Campbell, Henry F., 5,063,230, Cl. 514-213.000.

Yu, Chung-Li: *See*—
Kagawa, Koichi; Yu, Chung-Li; Kaku, Shinkyo; and Menon, Vinod, 5,063,526, Cl. 395-155.000.

Yu, Robert C. U.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Mammino, Joseph; Yu, Robert C. U.; Hamilton, Vincent E.; Limburg, William W.; and Chen, Cindy, 5,063,128, Cl. 430-63.000.

Yubakami, Keiichi: *See*—
Imai, Akihiro; Kawakami, Tetsuji; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, 5,063,198, Cl. 503-227.000.

Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Yanus, John F.; Limburg, William W.; and Mammino, Joseph, to Xerox Corporation. Electrically conductive layer for electrical devices. 5,063,125, Cl. 430-59.000.

Yuh, Huoy-Jen; Spiewak, John W.; Thornton, Constance J.; Mammino, Joseph; Yu, Robert C. U.; Hamilton, Vincent E.; Limburg, William W.; and Chen, Cindy, to Xerox Corporation. Conductive and blocking layers for electrophotographic imaging members. 5,063,128, Cl. 430-63.000.

Yuki, Shigeru: *See*—
Sawamura, Seishi; Nakajima, Sakuya; Amemori, Kunio; Oku, Hidehisa; Nakagawa, Akio; Kitayama, Ichiro; Matsuda, Hiromu; Yoshida, Katsuhiko; Takeda, Masaru; Nakane, Toshio; Horiguchi, Shiro; and Yuki, Shigeru, 5,062,856, Cl. 623-24.000.

Yukimoto, Sadao; Hirose, Toshifumi; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable composition. 5,063,270, Cl. 524-306.000.

Yumoto, Toshiyuki: *See*—
Nakayama, Hiroshi; and Yumoto, Toshiyuki, 5,062,822, Cl. 475-200.000.

Zahner, Paul; and Kaempf, Karl, to Metrohm AG. Volume measurement and dosage device. 5,062,547, Cl. 222-144.500.

Zaringhalam, Ali R.: *See*—
Cannella, Stephen J.; and Zaringhalam, Ali R., 5,063,592, Cl. 379-207.000.

Zelenak, Daniel G., Jr.: *See*—
Bishop, Robert J.; Fontecchio, Robert P.; and Zelenak, Daniel G., Jr., 5,062,664, Cl. 280-743.000.

Zeman, Robert E.; and Johnson, Kevin M., to Eastman Kodak Company. Electrophotographic apparatus having reduced drum drive flutter. 5,063,399, Cl. 346-160.100.

Zick, Daniel H., to Industrial Materials Technology, Inc. Method for uniaxial hip compaction. 5,063,022, Cl. 419-49.000.

Zimmermann, Peter: *See*—
Roth, Siegfried; Benz, Detlef; Reichle, Anton; Teske, Reiner; Zimmermann, Peter; Hager, Peter; Mueller, Josef; and Poenitzsch, Werner, 5,062,589, Cl. 244-117.00R.

Zip-Pak Incorporated: *See*—
Van Erden, Donald L.; McDonald, Daniel P.; and Ausnit, Steven, 5,063,069, Cl. 426-122.000.

Zison, Stanley W., to Pacific Energy. Landfill gas production testing and extraction method. 5,063,519, Cl. 364-510.000.

Zivley, George A., to ESM International, Inc. Sorting machine including photo site processing. 5,062,532, Cl. 209-581.000.

Zodrow, Rudolf, to ETI-TEC Maschinenbau GmbH. Support element for the followers of a cam drive of a drive mechanism and a labelling station equipped with a support element. 5,062,917, Cl. 156-568.000.

Zodrow, Rudolf, to ETI-TEC Maschinenbau GmbH. Glue segments which can be attachable to a drive shaft of a labelling machine. 5,062,918, Cl. 156-578.000.

Zoller-Kipper GmbH: *See*—
Pieperhoff, Hans J., 5,062,759, Cl. 414-408.000.

Zommer, Nathan, to IXYS Corporation. Insulated gate transistor devices with temperature and current sensor. 5,063,307, Cl. 307-310.000.

Zonco, Inc.: *See*—
Berglund, Andrew; James, James A.; and Easley, James B., 5,062,816, Cl. 440-101.000.

Zucker, Shlomo: *See*—
Gross, Joseph; and Zucker, Shlomo, 5,062,834, Cl. 604-143.000.

Zurn Industries, Inc.: *See*—
Saadi, Robert E.; Becker, Allen R.; Ball, Christopher J.; and Steffan, John, 5,062,453, Cl. 137-624.110.

Zwirgzdas, Anthony C.: *See*—
Schwartz, Russell J.; Zwirgzdas, Anthony C.; and Chamberlain, Terence R., 5,062,894, Cl. 106-23.000.

501 Automotive Products Plc: *See*—
Parsons, David; Bainbridge, Wilfred N.; Young, Alastair J.; and Temperley, Harry D., 5,062,320, Cl. 74-650.000.

501 Toray Industries, Inc.: *See*—
Hashimoto, Nobuo; Suzuki, Kunioki; and Saijo, Teruaki, 5,062,297, Cl. 73-597.000.

859545 Ontario Ltd.: *See*—
Nelson, Riley H., 5,062,630, Cl. 272-111.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF NOVEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brunswick Corporation: *See*—
Rumble, Joseph W.; and Sprague, William G., Re. 33,735, Cl. 273-80.00R.

Clarke, John P., to United States of America, Army. Periodic permanent magnet structure with increased useful field. Re. 33,736, Cl. 335-210.000.

Hendrikx, Wilhelmus J. M.; Moolenaar, Antonie J.; and Houben, Jan P. Device for driving a drilling and/or impacting tool. Re. 33,733, Cl. 173-109.000.

Hida, Yoshinori; Kozakai, Shohei; Katayama, Seiji; and Meguriya, Noriyuki, to Shin-Etsu Chemical Co., Ltd. Optical fiber coated with an organopolysiloxane curable actinic rays. Re. 33,737, Cl. 385-141.000.

Houben, Jan P.: *See*—
Hendrikx, Wilhelmus J. M.; Moolenaar, Antonie J.; and Houben, Jan P., Re. 33,733, Cl. 173-109.000.

Index-Werke GmbH & Co. KG Hahn & Tessky: *See*—
Link, Helmut F., Re. 33,732, Cl. 29-558.000.

Katayama, Seiji: *See*—
Hida, Yoshinori; Kozakai, Shohei; Katayama, Seiji; and Meguriya, Noriyuki, Re. 33,737, Cl. 385-141.000.

Kozakai, Shohei: *See*—
Hida, Yoshinori; Kozakai, Shohei; Katayama, Seiji; and Meguriya, Noriyuki, Re. 33,737, Cl. 385-141.000.

Link, Helmut F., to Index-Werke GmbH & Co. KG Hahn & Tessky. Method of machining a workpiece in a turret lathe and an NC lathe for performing this method. Re. 33,732, Cl. 29-558.000.

Meguriya, Noriyuki: *See*—
Hida, Yoshinori; Kozakai, Shohei; Katayama, Seiji; and Meguriya, Noriyuki, Re. 33,737, Cl. 385-141.000.

Moolenaar, Antonie J.: *See*—
Hendrikx, Wilhelmus J. M.; Moolenaar, Antonie J.; and Houben, Jan P., Re. 33,733, Cl. 173-109.000.

Rumble, Joseph W.; and Sprague, William G., to Brunswick Corporation. Golf club shaft. Re. 33,735, Cl. 273-80.00R.

Shin-Etsu Chemical Co., Ltd.: *See*—
Hida, Yoshinori; Kozakai, Shohei; Katayama, Seiji; and Meguriya, Noriyuki, Re. 33,737, Cl. 385-141.000.

Sprague, William G.: *See*—
Rumble, Joseph W.; and Sprague, William G., Re. 33,735, Cl. 273-80.00R.

United States of America
Army: *See*—
Clarke, John P., Re. 33,736, Cl. 335-210.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Clay, Stanton T., to Nimslo Corporation. Tamperproof security card. B1 4,869,946, 11-5-91, Cl. 428-167.000.

Greig, Nigel H.; Sweeney, Daniel J.; and Rapoport, Stanley I., to United States of America, Health and Human Services. Enhancing drug delivery to the brain. B1 4,835,182, 11-5-91, Cl. 514-538.000.

Lamy, Bernard: *See*—
Schneider, Michel; and Lamy, Bernard, B1 4,229,360, Cl. 260-403.000.

Liposome Company, Inc.: *See*—
Schneider, Michel; and Lamy, Bernard, B1 4,229,360, Cl. 260-403.000.

Nimslo Corporation: *See*—
Clay, Stanton T., B1 4,869,946, Cl. 428-167.000.

Rapoport, Stanley I.: *See*—
Greig, Nigel H.; Sweeney, Daniel J.; and Rapoport, Stanley I., B1 4,835,182, Cl. 514-538.000.

Schneider, Michel; and Lamy, Bernard, to Liposome Company, Inc. Process for the dehydration of a colloidal dispersion of liposomes. B1 4,229,360, 11-5-91, Cl. 260-403.000.

Sweeney, Daniel J.: *See*—
Greig, Nigel H.; Sweeney, Daniel J.; and Rapoport, Stanley I., B1 4,835,182, Cl. 514-538.000.

United States of America
Health and Human Services: *See*—
Greig, Nigel H.; Sweeney, Daniel J.; and Rapoport, Stanley I., B1 4,835,182, Cl. 514-538.000.

LIST OF DESIGN PATENTEES

Abrams, Robert C.: *See*—
Weder, Donald E.; Weder, Erwin, deceased; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 321,332, Cl. D11-164.000.

Adriance, Kyle: *See*—
Dolida, Roger J.; and Adriance, Kyle, 321,418, Cl. D29-7.000.

Alberti, Franco, to S.P.A. Strega Alberti Benevanto (S.A.B.). Surface ornamentation for a bottle. 321,316, 11-5-91, Cl. D9-307.000.

Aldrich, Thomas B., to Procter & Gamble Company, The. Brush handle. 321,286, 11-5-91, Cl. D4-104.000.

Allendorf, Stephan C.; and Dair, Thomas M., to Corning Incorporated. Combined eyeglasses and shielding cassette therefor. 321,355, 11-5-91, Cl. D16-102.000.

Amper, S.A.: *See*—
Martin, Emilio B., 321,362, Cl. D18-49.000.

Aoki, Takaaki; and Sato, Fumiko, to Nitto Boseki Co., Ltd. Wheel chair. 321,335, 11-5-91, Cl. D12-131.000.

AT&T Bell Laboratories: *See*—
Hørden, Daniel K.; and Havener, John B., 321,348, Cl. D14-141.000.

Augustino, Gary R.: *See*—
Augustino, Gloria S.; and Augustino, Gary R., 321,303, Cl. D7-688.000.

Augustino, Gloria S.; and Augustino, Gary R. Scraper for jars of baby food. 321,303, 11-5-91, Cl. D7-688.000.

Austin, Arnold S., to Quabaug Corporation. Tread surface and periphery of a footwear unit sole. 321,275, 11-5-91, Cl. D2-320.000.

Bakic, Karena, to Cosmede Anstalt. Cosmetic case. 321,416, 11-5-91, Cl. D28-83.000.

Bao, Anh; and Lin, Yu-Zong, to CSS Laboratories, Inc. Computer housing. 321,341, 11-5-91, Cl. D14-102.000.

Barfoot, James W.: *See*—
Beckman, Ralph A.; Sharpe, Henry D., III; Curado, Len; and Barfoot, James W., 321,400, Cl. D24-140.000.

Barnett, Burton W.; and Barnett, Mary. Electronic locating transmitter for lost children or the like. 321,329, 11-5-91, Cl. D10-104.000.

Barnett, Mary: *See*—
Barnett, Burton W.; and Barnett, Mary, 321,329, Cl. D10-104.000.

Bausch & Lomb Professional Dental Products, Inc.: *See*—
Beckman, Ralph A.; Sharpe, Henry D., III; Curado, Len; and Barfoot, James W., 321,400, Cl. D24-140.000.

Beckman, Ralph A.; Sharpe, Henry D., III; Curado, Len; and Barfoot, James W., to Bausch & Lomb Professional Dental Products, Inc. Periodontal probe. 321,400, 11-5-91, Cl. D24-140.000.

Behar, Marvin L. Casserole caddy. 321,306, 11-5-91, Cl. D7-607.000.

Beno, Steven J. Paper trimmer with storage compartments for office supplies. 321,368, 11-5-91, Cl. D18-34.000.

Bergstrand, John W.: *See—*
Weder, Donald E.; Weder, Erwin, deceased; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 321,332, Cl. D11-164.000.

Bernardini, Deborah L.: *See—*
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 321,270, Cl. D1-106.000.
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 321,271, Cl. D1-107.000.
Meyers, Edward J., Jr.; and Bernardini, Deborah L., 321,272, Cl. D1-109.000.

Betts, John H., to Polaroid Corporation. Pop-up strobe camera or similar article. 321,358, 11-5-91, Cl. D16-211.000.

Bischof, Brigitte; and Schmelzer, Horst-Dieter. Ceiling lighting fixture. 321,409, 11-5-91, Cl. D26-91.000.

Blake, Kenneth R.: *See—*
Scanlan, Timothy M.; and Blake, Kenneth R., 321,401, Cl. D24-147.000.

Bolk, Phyllis J.: *See—*
Weder, Donald E.; Weder, Erwin, deceased; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 321,332, Cl. D11-164.000.

Bostick, Charles R. Combined hand stamp and magnetic strip attachment. 321,365, 11-5-91, Cl. D18-15.000.

Bothun, Eugene L.: *See—*
Von Vett, Peter W.; and Bothun, Eugene L., 321,420, Cl. D32-15.000.

Brashear, Eric L.: *See—*
Shoemaker, Stephen P., Jr.; and Brashear, Eric L., 321,291, Cl. D6-407.000.

Breece, Roy L. Lug nut remover. 321,307, 11-5-91, Cl. D8-14.000.

Brohard, Bonnie J.: *See—*
Hughes, James S.; Ewing, Robert L.; Fouke, Herbert A.; and Brohard, Bonnie J., 321,408, Cl. D26-85.000.

Brown, Patrick W.: *See—*
Laib, Douglas M.; and Brown, Patrick W., 321,382, Cl. D21-120.000.

Brown, Ronald C. Solitaire playing board. 321,379, 11-5-91, Cl. D21-57.000.

Budzbanowski, Dennis J. Container. 321,324, 11-5-91, Cl. D9-425.000.

Butzko, Betty: *See—*
Montagnino, James G.; Butzko, Betty; Santhouse, Daniel; Hanlon, Tim; and Power, Steve, 321,412, Cl. D28-35.000.

Cardinal Packaging, Inc.: *See—*
Gunter, Harvey R., 321,318, Cl. D9-352.000.

Carroll, Terry: *See—*
Russell, John P.; and Carroll, Terry, 321,313, Cl. D8-370.000.

Caruso, Jerome C.; Estkowski, Christopher G.; and Lastuck, Lennard V., to Shepherd Products U.S., Inc. Chair base. 321,299, 11-5-91, Cl. D6-498.000.

Ceglia, Frank: *See—*
Meyers, Edward J., Jr.; Bernardini, Deborah L.; Ceglia, Frank; and Fogarty, Eileen, 321,270, Cl. D1-106.000.
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Chen, Darco. Combined basketball goal, height measurer and clothes-horse or the like. 321,392, 11-5-91, Cl. D21-201.000.

Chen, Fo-Chun, to Chuan Hsiang Tang Chemical Co. Ltd. Cosmetic case or similar article. 321,415, 11-5-91, Cl. D28-80.000.

Cheng, Billy, to Easterntec, Inc. Foldable advertisement slide projector. 321,360, 11-5-91, Cl. D16-229.000.

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Colida, Tony. Portable cellular handset telephone. 321,347, 11-5-91, Cl. D14-138.000.

Colida, Tony. Cellular portable handset telephone. 321,349, 11-5-91, Cl. D14-138.000.

Cooper, Dennis. Fly rod case. 321,281, 11-5-91, Cl. D3-38.000.

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D'Angeli, Mario. Combined ball holder and set of game balls. 321,280, 11-5-91, Cl. D3-36.000.

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Dewing, Gilbert A. Sandbox backhoe toy. 321,380, 11-5-91, Cl. D21-71.000.

Diehl, Volker; and Kuczewski, Gunter, to International Business Machines Corporation. Housing for magnetic strip reader or similar article. 321,342, 11-5-91, Cl. D14-107.000.

Dolida, Roger J.; and Adriance, Kyle, to Puritan-Bennett Corporation. Squeeze bag resuscitator. 321,418, 11-5-91, Cl. D29-7.000.

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Ernst Stadelmann Gesellschaft m.b.H.: *See—*
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Foster, Larry S.; Sapper, Richard F.; Silverstein, Steven A.; and Wang, James P., to International Business Machines Corporation. Computer crt monitor. 321,345, 11-5-91, Cl. D14-113.000.

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Galante, Carl J. Multi-purpose organizer. 321,371, 11-5-91, Cl. D19-77.000.

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Giuseppe, Orlandi, to Henkel Kommanditgesellschaft auf Aktien. Container for dispensing liquid cleansing agents or similar article. 321,319, 11-5-91, Cl. D9-366.000.

Greenlaw, John W. Bicycle drive chain guide. 321,334, 11-5-91, Cl. D12-114.000.

Gunter, Harvey R., to Cardinal Packaging, Inc. Container. 321,318, 11-5-91, Cl. D9-352.000.

Halm, Hans; and Weltgen, Paul-Otto, to Henkel Kommanditgesellschaft auf Aktien. Combined container and spray nozzle. 321,315, 11-5-91, Cl. D9-300.000.

Halm, Hans, to Henkel Kommanditgesellschaft auf Aktien. Liquid detergent dispenser with lid or similar article. 321,320, 11-5-91, Cl. D9-366.000.

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Hirose, Takashi; Kasahara, Yoshihiro; and Terauchi, Yukio, to NEC Corporation. Computer output printer. 321,363, 11-5-91, Cl. D18-54.000.

Hoese Corporation: *See—*
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Daubignard, Jean-Michel; Pauly, Pascal; and Pora, Philippe, 321,356, Cl. D16-102.000.
Perrier, Jean: *See*—
Nuebler, Sylvia, 321,295, Cl. D6-444.000.
Petrucci, Raymond M.; Taylor, Bruce G.; Giordano, Edward C.; Padilla, James M.; and Palmer, Carl, to Cuno, Incorporate. Quick-change filter cartridge. 321,394, 11-5-91, Cl. D23-209.000.
Petrus, R. Peter. Paint can rim protector. 321,325, 11-5-91, Cl. D9-435.000.
Phelan, Patrick G. Remote radiotelephone headset. 321,350, 11-5-91, Cl. D14-223.000.
Piles, Jonathan: *See*—
Westphal, Dennis; and Piles, Jonathan, 321,403, Cl. D25-52.000.
Polaroid Corporation: *See*—
Betts, John H., 321,358, Cl. D16-211.000.
Pora, Philippe: *See*—
Daubignard, Jean-Michel; Pauly, Pascal; and Pora, Philippe, 321,356, Cl. D16-102.000.
Postic, Stephen. Portable tray. 321,300, 11-5-91, Cl. D6-511.000.
Power, Steve: *See*—
Montagnino, James G.; Butzko, Betty; Santhouse, Daniel; Hanlon, Tim; and Power, Steve, 321,412, Cl. D28-35.000.
Primucci, Joseph; Hubel, Vello; and Gardiner, Alexander M., to Mirolin Industries Inc. Bath tub. 321,399, 11-5-91, Cl. D23-277.000.
Procter & Gamble Company, The: *See*—
Aldrich, Thomas B., 321,286, Cl. D4-104.000.
Duquet, Jacky P., 321,328, Cl. D10-46.200.
Fuchs, Paul D., 321,322, Cl. D9-375.000.
Wilgus, Frank R., 321,321, Cl. D9-375.000.
Proform Fitness Products, Inc.: *See*—
Dalebout, William T., 321,388, Cl. D21-195.000.
Puritan-Bennett Corporation: *See*—
Dolida, Roger J.; and Adriance, Kyle, 321,418, Cl. D29-7.000.
Purkapile, Emerson J., to Coca-Cola Company, The. Combined drink mixer and pitcher. 321,301, 11-5-91, Cl. D7-376.000.
Quabaug Corporation: *See*—
Austin, Arnold S., 321,275, Cl. D2-320.000.
Ranasinghe, Sisira. Italic Sinhalese font. 321,367, 11-5-91, Cl. D18-25.000.
Reichman, Richard, to Dynamic Classics, Ltd. Support for sit-up exercise or similar article. 321,386, 11-5-91, Cl. D21-191.000.
Rogers Manufacturing Company, Inc.: *See*—
Mark, Andrew, 321,279, Cl. D3-35.000.
Rollerblade, Inc.: *See*—
Olson, Brennan J.; and Frigard, Charles R., 321,393, Cl. D21-226.000.
Ross, William M. Toy chest. 321,294, 11-5-91, Cl. D6-434.000.
Royer, Christine, to Halston Enterprises, Inc. Earrings. 321,331, 11-5-91, Cl. D11-43.000.
RTC Industries, Inc.: *See*—
Miranda, Walter R., 321,296, Cl. D6-461.000.
Russell Finex Limited: *See*—
Vann, Nicholas R., 321,352, Cl. D15-7.000.
Russell, John P.; and Carroll, Terry, to Infection Control Products, Inc. Support hook. 321,313, 11-5-91, Cl. D8-370.000.
Ryobi Ltd.: *See*—
Sakamoto, Masakazu; Kikuchi, Naoki; and Nakanishi, Noboru, 321,337, Cl. D13-108.000.
Sakamoto, Masakazu; Kikuchi, Naoki; and Nakanishi, Noboru, 321,338, Cl. D13-108.000.
Saiger, Herbert C., to Crown Leisure Products, Inc. Chaise frame. 321,289, 11-5-91, Cl. D6-361.000.
Sakamoto, Masakazu; Kikuchi, Naoki; and Nakanishi, Noboru, to Ryobi Ltd. Battery charger. 321,337, 11-5-91, Cl. D13-108.000.
Sakamoto, Masakazu; Kikuchi, Naoki; and Nakanishi, Noboru, to Ryobi Ltd. Storage battery for electric tools. 321,338, 11-5-91, Cl. D13-108.000.
Samo, Harvey: *See*—
Underwood, Sky; Marks, Robert; Laubach, David; and Samo, Harvey, 321,304, Cl. D7-691.000.
Underwood, Sky; Marks, Robert; Laubach, David; and Samo, Harvey, 321,305, Cl. D7-691.000.
Santhouse, Daniel: *See*—
Montagnino, James G.; Butzko, Betty; Santhouse, Daniel; Hanlon, Tim; and Power, Steve, 321,412, Cl. D28-35.000.
Sapper, Richard: *See*—
Steinbugler, Robert E.; Sapper, Richard; Wetzel, Timothy D.; and Williams, Roger C., 321,344, Cl. D14-113.000.
Sapper, Richard F.: *See*—
Foster, Larry S.; Sapper, Richard F.; Silverstein, Steven A.; and Wang, James P., 321,345, Cl. D14-113.000.

Sato, Fumiko: *See—*
Aoki, Takaaki; and Sato, Fumiko, 321,335, Cl. D12-131.000.
Savio, Dino M., to International Business Machines Corporation. Data input/output terminal for monitoring patients. 321,340, 11-5-91, Cl. D14-100.000.
Scanlan International, Inc.: *See—*
Scanlan, Timothy M.; and Blake, Kenneth R., 321,401, Cl. D24-147.000.
Scanlan, Timothy M.; and Blake, Kenneth R., to Scanlan International, Inc. Surgical pin tip. 321,401, 11-5-91, Cl. D24-147.000.
Schlesselman, Edwin G., to LSI Industries Inc. Exterior lighting fixture. 321,406, 11-5-91, Cl. D26-67.000.
Schmelzer, Horst-Dieter: *See—*
Bischof, Brigitte; and Schmelzer, Horst-Dieter, 321,409, Cl. D26-91.000.
Sharp Corporation: *See—*
Sugiyama, Masakazu, 321,346, Cl. D14-129.000.
Sharpe, Henry D., III: *See—*
Beckman, Ralph A.; Sharpe, Henry D., III; Curado, Len; and Barfoot, James W., 321,400, Cl. D24-140.000.
Shepherd Products U.S., Inc.: *See—*
Caruso, Jerome C.; Estkowski, Christopher G.; and Lastuck, Lennard V., 321,299, Cl. D6-498.000.
Sherman, Adam; and Stagl, Peter, to Colgate-Palmolive Company. Combined container and dispenser. 321,317, 11-5-91, Cl. D9-337.000.
Shoemaker, Stephen P., Jr.; and Brashear, Eric L. Storage rack for compact discs, cassettes and the like. 321,291, 11-5-91, Cl. D6-407.000.
Shwisha, Haim, to Electrix, Inc. Adjustable lamp. 321,405, 11-5-91, Cl. D26-65.000.
Sigmon, John F. Carrying case for an inflatable wash basin. 321,282, 11-5-91, Cl. D3-39.000.
Silverstein, Steven A.: *See—*
Foster, Larry S.; Sapper, Richard F.; Silverstein, Steven A.; and Wang, James P., 321,345, Cl. D14-113.000.
Slayton, Nancy D., to Dart Industries Inc. Toy puzzle. 321,381, 11-5-91, Cl. D21-105.000.
Smith, Russell D., to General Electric Company. Scraper to clean the fins of heat exchangers or the like. 321,422, 11-5-91, Cl. D32-46.000.
S.P.A. Strega Alberti Benevanto (S.A.B.): *See—*
Alberti, Franco, 321,316, Cl. D9-307.000.
Sony Corporation: *See—*
Nakamura, Yuhko, 321,323, Cl. D9-415.000.
Soule, Scott T. Pull tab for slide fasteners. 321,333, 11-5-91, Cl. D11-221.000.
Stack, Thomas J.; and Korczynski, Jacek M., to Cooper Industries, Inc. Firewall mount high AMP circuit breaker. 321,339, 11-5-91, Cl. D13-160.000.
Stagl, Peter: *See—*
Sherman, Adam; and Stagl, Peter, 321,317, Cl. D9-337.000.
Steelcase Strafor: *See—*
Heidmann, Charles, 321,407, Cl. D26-72.000.
Steinbugler, Robert E.; Sapper, Richard; Wetzel, Timothy D.; and Williams, Roger C., to International Business Machines Corporation. Computer display. 321,344, 11-5-91, Cl. D14-113.000.
Sugiyama, Masakazu, to Sharp Corporation. Combined projection screen and speakers. 321,346, 11-5-91, Cl. D14-129.000.
Suncast Corporation: *See—*
Whitehead, Stephen P., 321,395, Cl. D23-216.000.
Whitehead, Stephen P., 321,396, Cl. D23-216.000.
Taormina, Joseph T.; and Murray, Lyndon K., to Taormina & Murray Productions. Game board. 321,378, 11-5-91, Cl. D21-30.000.
Taormina & Murray Productions: *See—*
Taormina, Joseph T.; and Murray, Lyndon K., 321,378, Cl. D21-30.000.
Taylor, Bruce G.: *See—*
Petrucci, Raymond M.; Taylor, Bruce G.; Giordano, Edward C.; Padilla, James M.; and Palmer, Carl, 321,394, Cl. D23-209.000.
Terauchi, Yukio: *See—*
Hirose, Takashi; Kasahara, Yoshihiro; and Terauchi, Yukio, 321,363, Cl. D18-54.000.
Tooker, Tracey. Stationery folder or the like. 321,369, 11-5-91, Cl. D19-26.000.
Top Kogyo Co., Ltd.: *See—*
Toyoshima, Masami, 321,310, Cl. D8-22.000.
Toyoshima, Masami, 321,311, Cl. D8-22.000.
Toyoshima, Masami, to Top Kogyo Co., Ltd. Adjustable wrench. 321,310, 11-5-91, Cl. D8-22.000.
Toyoshima, Masami, to Top Kogyo Co., Ltd. Adjustable wrench. 321,311, 11-5-91, Cl. D8-22.000.
Tussing, John T.; and Tussing, Ronald D. Yarn holder or similar article. 321,277, 11-5-91, Cl. D3-26.000.
Tussing, Ronald D.: *See—*
Tussing, John T.; and Tussing, Ronald D., 321,277, Cl. D3-26.000.
Underwood, Sky; Marks, Robert; Laubach, David; and Samo, Harvey, to Lever Brothers Company, Division of Conopco, Inc. Combined scoop and cover therefor. 321,304, 11-5-91, Cl. D7-691.000.
Underwood, Sky; Marks, Robert; Laubach, David; and Samo, Harvey, to Lever Brothers Company, Division of Conopco, Inc. Scoop. 321,305, 11-5-91, Cl. D7-691.000.
U.S. Philips Corporation: *See—*
Elkerbout, Marten F., 321,413, Cl. D28-51.000.
Vann, Nicholas R., to Russell Finex Limited. Mobile in-line strainer for paints and resins or the like. 321,352, 11-5-91, Cl. D15-7.000.
Video Technologies Industries, Inc.: *See—*
Leung, Chi-Kit, 321,376, Cl. D21-13.000.
Video Technology Industries, Inc.: *See—*
Cheung, David T.; and Ko, Thomas M., 321,384, Cl. D21-142.000.
Ko, Man-Ho, 321,377, Cl. D21-13.000.
Leung, Chi-Kit, 321,375, Cl. D21-13.000.
Von Vett, Peter W.; and Bothun, Eugene L., to Windsor Industries, Inc. Floor polishing machine. 321,420, 11-5-91, Cl. D32-15.000.
Wallace, Dean R., to Intertech Resources Inc. Face mask. 321,419, 11-5-91, Cl. D29-8.000.
Wang, James P.: *See—*
Foster, Larry S.; Sapper, Richard F.; Silverstein, Steven A.; and Wang, James P., 321,345, Cl. D14-113.000.
Weder, Donald E.; Weder, Erwin, deceased (by Weder, Donald E. Weder and Wanda M., co-executors); Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., to Highland Supply Corporation. Flower pot cover. 321,332, 11-5-91, Cl. D11-164.000.
Weder, Donald E. Weder and Wanda M., co-executors: *See—*
Weder, Donald E.; Weder, Erwin, deceased; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 321,332, Cl. D11-164.000.
Weder, Erwin, deceased: *See—*
Weder, Donald E.; Weder, Erwin, deceased; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 321,332, Cl. D11-164.000.
Weder, Wanda M.: *See—*
Weder, Donald E.; Weder, Erwin, deceased; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 321,332, Cl. D11-164.000.
Weeks, Arthur N. Necktie. 321,276, 11-5-91, Cl. D2-605.000.
Weltgen, Paul-Otto: *See—*
Halm, Hans; and Weltgen, Paul-Otto, 321,315, Cl. D9-300.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window sash takeout cover. 321,403, 11-5-91, Cl. D25-52.000.
Wetzel, Timothy D.: *See—*
Steinbugler, Robert E.; Sapper, Richard; Wetzel, Timothy D.; and Williams, Roger C., 321,344, Cl. D14-113.000.
Whitehead, Stephen P., to Suncast Corporation. Oscillating sprinkler. 321,395, 11-5-91, Cl. D23-216.000.
Whitehead, Stephen P., to Suncast Corporation. Oscillating sprinkler. 321,396, 11-5-91, Cl. D23-216.000.
Whitlock, Shirley: *See—*
Whitlock, Van; and Whitlock, Shirley, 321,374, Cl. D20-42.000.
Whitlock, Van; and Whitlock, Shirley. Windshield sticker holder. 321,374, 11-5-91, Cl. D20-42.000.
Wilgus, Frank R., to Procter & Gamble Company, The. Bottle. 321,321, 11-5-91, Cl. D9-375.000.
Williams, Daniel L.: *See—*
Feer, David L.; and Williams, Daniel L., 321,343, Cl. D14-107.000.
Williams, Roger C.: *See—*
Steinbugler, Robert E.; Sapper, Richard; Wetzel, Timothy D.; and Williams, Roger C., 321,344, Cl. D14-113.000.
Williamson, Bruce L. Vehicle brake lock for use while loading or unloading a boat from a trailer on an incline. 321,312, 11-5-91, Cl. D8-339.000.
Windsor Industries, Inc.: *See—*
Von Vett, Peter W.; and Bothun, Eugene L., 321,420, Cl. D32-15.000.
Winzeler, Robert C., III, to Design Institute of America. Table base. 321,297, 11-5-91, Cl. D6-495.000.
Winzeler, Robert C., III, to Design Institute America, Inc. Table base. 321,298, 11-5-91, Cl. D6-495.000.
Woll, Douglas R.; and Woll, Margo Y. Toothbrush. 321,287, 11-5-91, Cl. D4-106.000.
Woll, Margo Y.: *See—*
Woll, Douglas R.; and Woll, Margo Y., 321,287, Cl. D4-106.000.
Yanai, Makoto: *See—*
Izumi, Tatsuro; and Yanai, Makoto, 321,359, Cl. D16-219.000.
Yianilos, Peter N., to Franklin Electronic Publishers, Incorporated. Curved font. 321,366, 11-5-91, Cl. D18-24.000.
Zettle, Steven. Finger-operated squeegee. 321,421, 11-5-91, Cl. D32-41.000.
Zimmerman, Larry G., to Dart Industries Inc. Tray cover or the like. 321,302, 11-5-91, Cl. D7-392.100.

LIST OF PLANT PATENTEES

Bauer, Annelise; and Schlindwein, Birgit, to Bauer, Annelise. Variety of strawberry named Florika. 7,701, 11-5-91, Cl. 48.000.

Beck, James W. Orange tree 'Beck Early Navel' . 7,700, 11-5-91, Cl. 45.000.

Holtkamp, Reinhold, Sr. African violet plant named Little Blackfoot Girl. 7,704, 11-5-91, Cl. 69.000.

Holtkamp, Reinhold, Sr. African violet plant named Little Navajo Girl. 7,705, 11-5-91, Cl. 69.000.

Mojonnier, Erwin. Alstroemeria plant named Maria. 7,703, 11-5-91, Cl. 68.000.

Pennington, Russell R., Sr. *Pentas lanceolata* plant named Jessica. 7,702, 11-5-91, Cl. 68.000.

Schlindwein, Birgit: *See—*
Bauer, Annelise; and Schlindwein, Birgit, 7,701, Cl. 48.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 5TH DAY OF NOVEMBER, 1991

A. E. Staley Manufacturing Co.: *See—*
Hartman, Guy J., H989, Cl. 530-422.000.

Arasteh, Dariush K.: *See—*
Selkowitz, Stephen E.; Arasteh, Dariush K.; and Hartmann, John L., H975, Cl. 52-172.000.

Benz, August D.: *See—*
Venkatachari, Mukund K.; Benz, August D.; and Huettenhain, Horst, H981, Cl. 44-282.000.

Berggren, Mark A.; and Garton, Lance M. Method for preparing polymeric membranes in-situ and an apparatus for performing this process. H982, 11-5-91, Cl. 264-171.000.

Bronson, Barry S. Video display enhancement. H997, 11-5-91, Cl. 364-521.000.

Brooks, Jeffrey N.; and Mattas, Richard F., to United States of America, Energy. Self-pumping impurity control. H984, 11-5-91, Cl. 376-146.000.

Brown, Houston S.; and Westbrook, Paul A. Polyketone fibers. H983, 11-5-91, Cl. 264-211.170.

Buchanan, Relva C.; and Maurice, Alena K. Temperature stable ceramic dielectric compositions. H987, 11-5-91, Cl. 501-137.000.

Christopulos, John A., to United States of America, Army. Cell compartment for battery matrix. H985, 11-5-91, Cl. 429-99.000.

Codella, Christopher F.; Rovedo, Nivo; and Ogura, Seiki, to International Business Machines Corporation. Field effect-transistor with asymmetrical structure. H986, 11-5-91, Cl. 437-41.000.

Ebejer, Lino P.: *See—*
Gaal, Peter S.; Ebejer, Lino P.; Kareis, James H.; and Schlegel, Gary L., H978, Cl. 108-20.000.

Exxon Chemical Company: *See—*
Kurzbuch, Werner; Mitchell, Larry J.; and Scheller, Andor, H977, Cl. 100-179.000.

Fertel, Lawrence B.; and Lin, Henry C., to Occidental Chemical Corporation. Preparation of fluorobenzenes by the decarboxylation of fluorophthalic acids or benzoic acids. H992, 11-5-91, Cl. 570-142.000.

Fischer, John W.; and Hollins, Richard A., to United States of America, Navy. Synthesis of nitratomethylmethyloxetane (NMMO). H991, 11-5-91, Cl. 549-510.000.

Gaal, Peter S.; Ebejer, Lino P.; Kareis, James H.; and Schlegel, Gary L., to United States of America, Energy. Hot cell examination table. H978, 11-5-91, Cl. 108-20.000.

Garton, Lance M.: *See—*
Berggren, Mark A.; and Garton, Lance M., H982, Cl. 264-171.000.

Gergen, William P.; Machado, Joseph M.; Waters, Dixie G.; and Gingrich, Randall P., to Shell Oil Company. Polymer blends. H988, 11-5-91, Cl. 525-179.000.

Gingrich, Randall P.: *See—*
Gergen, William P.; Machado, Joseph M.; Waters, Dixie G.; and Gingrich, Randall P., H988, Cl. 525-179.000.

Gunn, Jack T.: *See—*
Ohst, David W.; Gunn, Jack T.; and Pavlik, Dennis, H994, Cl. 310-178.000.

Harrison, Cecil P., to Tennessee Valley Authority. Two-stage, single-unit, and energy-efficient granulator dryer. H980, 11-5-91, Cl. 425-222.000.

Hartman, Guy J., to A. E. Staley Manufacturing Co. Purification of hydrolyzed protein by extraction. H989, 11-5-91, Cl. 530-422.000.

Hartmann, John L.: *See—*
Selkowitz, Stephen E.; Arasteh, Dariush K.; and Hartmann, John L., H975, Cl. 52-172.000.

Hollins, Richard A.: *See—*
Fischer, John W.; and Hollins, Richard A., H991, Cl. 549-510.000.

Huettenhain, Horst: *See—*
Venkatachari, Mukund K.; Benz, August D.; and Huettenhain, Horst, H981, Cl. 44-282.000.

International Business Machines Corporation: *See—*
Codella, Christopher F.; Rovedo, Nivo; and Ogura, Seiki, H986, Cl. 437-41.000.

Kareis, James H.: *See—*
Gaal, Peter S.; Ebejer, Lino P.; Kareis, James H.; and Schlegel, Gary L., H978, Cl. 108-20.000.

Kayser, Eleonore G., to United States of America, Navy. Recrystallization of 3-nitro-1,2,4-triazol-5-one from dimethylsulfoxide and methylene chloride. H990, 11-5-91, Cl. 548-263.800.

Kelley, Malcolm E., to United States of America, Air Force. Cockpit vision and protection apparatus. H979, 11-5-91, Cl. 244-129.300.

Kimura, Yoshikazu: *See—*
Mizobuchi, Shotaro; Sasaki, Katsumi; and Kimura, Yoshikazu, H974, Cl. 29-898.041.

Kurzbuch, Werner; Mitchell, Larry J.; and Scheller, Andor, to Exxon Chemical Company. Apparatus and method for inducing blocking in plastic films under known conditions. H977, 11-5-91, Cl. 100-179.000.

Lin, Henry C.: *See—*
Fertel, Lawrence B.; and Lin, Henry C., H992, Cl. 570-142.000.

Lovelady, Kenneth T.: *See—*
McWaters, Lynn D.; and Lovelady, Kenneth T., H996, Cl. 340-728.000.

Machado, Joseph M.: *See—*
Gergen, William P.; Machado, Joseph M.; Waters, Dixie G.; and Gingrich, Randall P., H988, Cl. 525-179.000.

Matta, Joseph E.; and Tytus, Raymond P., to United States of America, Army. Apparatus and method for measuring elongational viscosity of a polymeric solution. H976, 11-5-91, Cl. 73-54.000.

Mattas, Richard F.: *See—*
Brooks, Jeffrey N.; and Mattas, Richard F., H984, Cl. 376-146.000.

Maurice, Alena K.: *See—*
Buchanan, Relva C.; and Maurice, Alena K., H987, Cl. 501-137.000.

McWaters, Lynn D.; and Lovelady, Kenneth T., to Recognition Equipment Incorporated. High resolution page image display system. H996, 11-5-91, Cl. 340-728.000.

Mitchell, Larry J.: *See—*
Kurzbuch, Werner; Mitchell, Larry J.; and Scheller, Andor, H977, Cl. 100-179.000.

Mizobuchi, Shotaro; Sasaki, Katsumi; and Kimura, Yoshikazu. Thrust bearing and method of manufacturing thereof. H974, 11-5-91, Cl. 29-898.041.

Moran, Robert D., to United States of America, Navy. Preamplifier for laser guided projectile. H995, 11-5-91, Cl. 330-278.000.

Occidental Chemical Corporation: *See—*
Fertel, Lawrence B.; and Lin, Henry C., H992, Cl. 570-142.000.

Ogura, Seiki: *See—*
Codella, Christopher F.; Rovedo, Nivo; and Ogura, Seiki, H986, Cl. 437-41.000.

Ohst, David W.; Gunn, Jack T.; and Pavlik, Dennis, to United States of America, Army. Transposed air core homopolar generator conductors. H994, 11-5-91, Cl. 310-178.000.

Pavlik, Dennis: *See—*
Ohst, David W.; Gunn, Jack T.; and Pavlik, Dennis, H994, Cl. 310-178.000.

Recognition Equipment Incorporated: *See—*
McWaters, Lynn D.; and Lovelady, Kenneth T., H996, Cl. 340-728.000.

Rovedo, Nivo: *See—*
Codella, Christopher F.; Rovedo, Nivo; and Ogura, Seiki, H986, Cl. 437-41.000.

Sartore, Richard G., to United States of America, Army. Thin film thickness mapping technique. H993, 11-5-91, Cl. 250-307.000.

Sasaki, Katsumi: *See*—
Mizobuchi, Shotaro; Sasaki, Katsumi; and Kimura, Yoshikazu, H974, Cl. 29-898.041.
Scheller, Andor: *See*—
Kurzbuch, Werner; Mitchell, Larry J.; and Scheller, Andor, H977, Cl. 100-179.000.
Schlegel, Gary L.: *See*—
Gaal, Peter S.; Ebejer, Lino P.; Kareis, James H.; and Schlegel, Gary L., H978, Cl. 108-20.000.
Selkowitz, Stephen E.; Arasteh, Dariush K.; and Hartmann, John L., to United States of America, Energy. Thermal insulated glazing unit. H975, 11-5-91, Cl. 52-172.000.
Shell Oil Company: *See*—
Gergen, William P.; Machado, Joseph M.; Waters, Dixie G.; and Gingrich, Randall P., H988, Cl. 525-179.000.
Tennessee Valley Authority: *See*—
Harrison, Cecil P., H980, Cl. 425-222.000.
Tytus, Raymond P.: *See*—
Matta, Joseph E.; and Tytus, Raymond P., H976, Cl. 73-54.000.
United States of America
Air Force: *See*—
Kelley, Malcolm E., H979, Cl. 244-129.300.
Army: *See*—
Christopulos, John A., H985, Cl. 429-99.000.
Matta, Joseph E.; and Tytus, Raymond P., H976, Cl. 73-54.000.
Ohst, David W.; Gunn, Jack T.; and Pavlik, Dennis, H994, Cl. 310-178.000.
Sartore, Richard G., H993, Cl. 250-307.000.
Energy: *See*—
Brooks, Jeffrey N.; and Mattas, Richard F., H984, Cl. 376-146.000.
Gaal, Peter S.; Ebejer, Lino P.; Kareis, James H.; and Schlegel, Gary L., H978, Cl. 108-20.000.
Selkowitz, Stephen E.; Arasteh, Dariush K.; and Hartmann, John L., H975, Cl. 52-172.000.
Venkatachari, Mukund K.; Benz, August D.; and Huettenhain, Horst, H981, Cl. 44-282.000.
Navy: *See*—
Fischer, John W.; and Hollins, Richard A., H991, Cl. 549-510.000.
Kayser, Eleonore G., H990, Cl. 548-263.800.
Moran, Robert D., H995, Cl. 330-278.000.
Venkatachari, Mukund K.; Benz, August D.; and Huettenhain, Horst, to United States of America, Energy. Process for selective grinding of coal. H981, 11-5-91, Cl. 44-282.000.
Waters, Dixie G.: *See*—
Gergen, William P.; Machado, Joseph M.; Waters, Dixie G.; and Gingrich, Randall P., H988, Cl. 525-179.000.
Westbrook, Paul A.: *See*—
Brown, Houston S.; and Westbrook, Paul A., H983, Cl. 264-211.170.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 5, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8	5,062,156
46	5,062,158
114	5,062,159
	5,062,160
169	5,062,161
171	5,062,157
424	5,062,162
	5,062,163

CLASS 4

194	5,062,164
427	5,062,166
480	5,062,165

CLASS 5

61	5,062,167
413	5,062,168
449	5,062,169
450	5,062,170
455	5,062,171
474	5,062,172

CLASS 7

118	5,062,173

CLASS 8

639	5,062,861

CLASS 14

69.5	5,062,174

CLASS 15

88.2	5,062,177
103	5,062,175
250.23	5,062,176

CLASS 16

38	5,062,178
111 R	5,062,179
257	5,062,180
354	5,062,181
368	5,062,182

CLASS 19

225	5,062,183

CLASS 23

295 R	5,062,862

CLASS 24

16 PB	5,062,184
49 CC	5,062,185
389	5,062,186

CLASS 29

33 P	5,062,188
	5,062,190
33 R	5,062,189
33 T	5,062,187
229	5,062,191
426.4	5,062,192
426.6	5,062,193
451	5,062,194
558	Re.33,732
568	5,062,195
603	5,062,196
606	5,062,197
622	5,062,198
727	5,062,199
732	5,062,200
741	5,062,201
749	5,062,202
852	5,062,203
	5,062,204
889.7	5,062,205
890.01	5,062,206
890.14	5,062,207
898.049	5,062,208

CLASS 30

41.7	5,062,209
317	5,062,210
322	5,062,211

CLASS 33

270	5,062,212
479	5,062,213
706	5,062,214
755	5,062,215

CLASS 34

16	5,062,216
22	5,062,217
114	5,062,218
133	5,062,219
155	5,062,220
204	5,062,221

CLASS 36

2.6	5,062,222
7.1 R	5,062,223
117	5,062,224
	5,062,225
	5,062,226

CLASS 37

117.5	5,062,227
	5,062,228

CLASS 40

107	5,062,229

CLASS 42

1.09	5,062,230
	5,062,231
70.11	5,062,232
	5,062,233

CLASS 43

1	5,062,234
42	5,062,235
42.5	5,062,236
86	5,062,237

CLASS 44

341	5,062,863

CLASS 47

1.01	5,062,238
79	5,062,239

CLASS 49

348	5,062,240
460	5,062,241

CLASS 51

295	5,062,865

CLASS 52

36	5,062,242
66	5,062,243
98	5,062,244
118	5,062,245
126.4	5,062,246
200	5,062,247
208	5,062,248
320	5,062,249
584	5,062,250

CLASS 53

134.1	5,062,251
434	5,062,252
451	5,062,253
467	5,062,254

CLASS 54

7	5,062,255
78	5,062,256

CLASS 55

16	5,062,866
96	5,062,867
97	5,062,868
159	5,062,869
213	5,062,870
259	5,062,871
302	5,062,872
	5,062,873
337	5,062,874
493	5,062,875
495	5,062,864

CLASS 56

11.1	5,062,257
202	5,062,258
255	5,062,259
380	5,062,260

CLASS 57

281	5,062,261

CLASS 60

39.36	5,062,262
299	5,062,263
427	5,062,264
450	5,062,265
466	5,062,266
493	5,062,267
533	5,062,268

CLASS 62

4	5,062,269
12	5,062,270
55.5	5,062,271
78	5,062,272
85	5,062,273
117	5,062,274
174	5,062,275
176.6	5,062,276
193	5,062,277
230	5,062,278
235	5,062,279
291	5,062,280
457.1	5,062,281

CLASS 65

1	5,062,876
30.13	5,062,877

CLASS 70

209	5,062,282

CLASS 71

65	5,062,878
92	5,062,879
	5,062,880
	5,062,881
93	5,062,882
94	5,062,883
95	5,062,884

CLASS 72

10	5,062,283
46	5,062,284
272	5,062,285
305	5,062,286
336	5,062,287
383	5,062,288
	5,062,289
416	5,062,290

CLASS 73

3	5,062,291
19.01	5,062,292
81	5,062,293
115	5,062,294
290 V	5,062,295
579	5,062,296
597	5,062,297
	5,062,298
609	5,062,299
623	5,062,300
629	5,062,301
754	5,062,302
798	5,062,303
861	5,062,304
861.12	5,062,305
862.33	5,062,306
862.36	5,062,307
864.41	5,062,308
864.44	5,062,309
866.5	5,062,310

CLASS 74

44	5,062,311
89.14	5,062,312
335	5,062,313
475	5,062,314
502.2	5,062,315
529	5,062,316
560	5,062,317
594.2	5,062,318
612	5,062,319
650	5,062,320
866	5,062,321

CLASS 75

255	5,062,885
371	5,062,886
425	5,062,887
739	5,062,888

CLASS 76

82.1	5,062,322

CLASS 81

15.7	5,062,323
20	5,062,324
57.32	5,062,326
124.3	5,062,327
186	5,062,328
436	5,062,325
488	5,062,329

CLASS 82

147	5,062,330

CLASS 83

37	5,062,331
74	5,062,332
94	5,062,333
95	5,062,340
99	5,062,334
168	5,062,335
198	5,062,336
552	5,062,337
763	5,062,339
848	5,062,338

CLASS 84

702	5,062,341
744	5,062,342

CLASS 86

20.1	5,062,343

CLASS 87

8	5,062,344

CLASS 89

1.817	5,062,345
14.1	5,062,346
37.07	5,062,347

CLASS 91

369.2	5,062,348
436	5,062,349
448	5,062,350

CLASS 98

2.08	5,062,352
2.09	5,062,351
2.11	5,062,353
62	5,062,354

CLASS 99

349	5,062,355
428	5,062,356

CLASS 100

53	5,062,357
218	5,062,358

CLASS 101

152	5,062,359
	5,062,360
269	5,062,361
348	5,062,362
415.1	5,062,363
467	5,062,364

CLASS 102

322	5,062,365
430	5,062,366
530	5,062,367

CLASS 104

172.3	5,062,368

CLASS 105

396	5,062,369

CLASS 106

20	5,062,891
22	5,062,892
	5,062,893
23	5,062,894
27	5,062,890
36	5,062,895
197.2	5,062,889
287.19	5,062,896
696	5,062,897

CLASS 108

51.3	5,062,370

CLASS 110

214	5,062,371
242	5,062,372

CLASS 112

113	5,062,373
130	5,062,374

CLASS 114

210	5,062,375
230	5,062,376
270	5,062,377
274	5,062,378
311	5,062,379

CLASS 116

28 R	5,062,380
225	5,062,381

CLASS 118

500	5,062,384
653	5,062,385
723	5,062,508
725	5,062,386

CLASS 119

28	5,062,387
51.04	5,062,382
52.2	5,062,388
57.6	5,062,389
72	5,062,390
	5,062,391
167	5,062,392
173	5,062,383

CLASS 123

41.72	5,062,393
56 AC	5,062,394
65 VD	5,062,395
73 BA	5,062,396
188 P	5,062,397
196 R	5,062,398
198 D	5,062,399
198 DB	5,062,400
333	5,062,401
399	5,062,404
413	5,062,403
425	5,062,402
468	5,062,405

CLASS 124

25	5,062,406
44.5	5,062,407

CLASS 126

41 R	5,062,408
99 R	5,062,409
299 D	5,062,410
523	5,062,411

CLASS 128

24 OEL	5,062,412
66	5,062,413
68.1	5,062,414
76 R	5,062,415
79	5,062,416
	5,062,417
156	5,062,418
200.21	5,062,419
204.18	5,062,420
205.27	5,062,421
207.14	5,062,422
207.15	5,062,423
379	5,062,424
401	5,062,425
640	5,062,426
661.01	5,062,429
661.09	5,062,430
661.10	5,062,427
664	5,062,428
665	5,062,431
736	5,062,432
888	5,062,433

CLASS 131

336	5,062,434

CLASS 132

108	5,062,435
279	5,062,436
323	5,062,437

CLASS 134

7	5,062,898
9	5,062,438

CLASS 136

259	5,062,899

CLASS 137

15	5,062,439
38	5,062,440
81.1	5,062,441
110	5,062,442
113	5,062,443
202	5,062,444
340	5,062,445
468	5,062,446
493	5,062,447
498	5,062,448
505.46	5,062,449
533.17	5,062,451
533.21	5,062,450
533.25	5,062,452
624.11	5,062,453
625.61	5,062,454

CLASS 138

30	5,062,455
125	5,062,456
	5,062,457

CLASS 141

80	5,062,458
91	5,062,459

CLASS 144

136 C	5,062,460

CLASS 148

4	5,062,900
11.5 A	5,062,901
23	5,062,902
24	5,062,903
105	5,062,904
111	5,062,905
	5,062,906
301	5,062,907
304	5,062,909
332	5,062,908

CLASS 152

209 R	5,062,461
548	5,062,462

CLASS 156

82	5,062,910
89	5,062,911
145	5,062,912
154	5,062,913
172	5,062,914
252	5,062,915
269	5,062,916
356	5,062,919
380.4	5,062,920
568	5,062,917
578	5,062,918

CLASS 160

38	5,062,463
193	5,062,464

CLASS 162

31	5,062,921
158	5,062,922
265	5,062,923
358	5,062,924

CLASS 164

4.1	5,062,465
7.1	5,062,466
	5,062,467
122.2	5,062,468
	5,062,469
457	5,062,470

CLASS 165

8	5,062,471
41	5,062,472
42	5,062,473
109.1	5,062,474
151	5,062,475
173	5,062,476
174	5,062,477
178	5,062,478

CLASS 166

84	5,062,479
108	5,062,480
153	5,062,481
250	5,062,482
263	5,062,483
278	5,062,484
297	5,062,485

CLASS 169

70	5,062,486
91	5,062,487

CLASS 172

1	5,062,488

311 5,062,489

CLASS 173

12 5,062,491
104 5,062,490
109 Re.33,733

CLASS 174

35 R 5,063,273
158 F 5,063,274

CLASS 177

25.14 5,062,492

CLASS 180

9.52 5,062,493
132 5,062,494
227 5,062,495
291 5,062,496
300 5,062,497
308 5,062,498

CLASS 182

166 5,062,499

CLASS 184

106 5,062,500

CLASS 187

112 5,062,501
124 5,062,502

CLASS 188

71.5 5,062,503
79.56 5,062,504
153 R 5,062,505
329 5,062,506
378 5,062,507

CLASS 190

333 5,062,519

CLASS 192

0.096 5,062,516
4 A 5,062,509
4 C 5,062,510
5 5,062,511
45 5,062,512
70.17 5,062,513
82 T 5,062,514
91 A 5,062,515
106.2 5,062,517

CLASS 194

317 5,062,518

CLASS 198

335 5,062,520
389 5,062,521
400 5,062,522
463.4 5,062,523
465.4 5,062,524
468.6 5,062,525

CLASS 200

529 5,063,276
531.0 5,063,277

CLASS 201

41 5,062,925

CLASS 202

183 5,062,926

CLASS 203

89 5,062,927

CLASS 204

15 5,062,928
67 5,062,929
82 5,062,930
129.46 5,062,933
129.7 5,062,931
130 5,062,932
146 5,062,941
147 5,062,934
157.41 5,062,935
164 5,062,936
192.15 5,062,937
192.17 5,062,939
192.2 5,062,938
228 5,062,940
299 R 5,062,942

CLASS 206

6.1 5,062,526
315.3 5,062,528
349 5,062,529
425 5,062,530
564 5,062,531

CLASS 208

59 5,062,943
113 5,062,944
5,062,945
115 5,062,946
216 R 5,062,947
251 R 5,062,948

CLASS 209

310 5,062,949
581 5,062,532

CLASS 210

86 5,062,950
169 5,062,951
232 5,062,952
5,062,953
502.1 5,062,954
512.1 5,062,955
611 5,062,956
5,062,957
5,062,958
635 5,062,959
638 5,062,960
656 5,062,961
698 5,062,962
712 5,062,963
740 5,062,964
748 5,062,965
753 5,062,966
755 5,062,967
771 5,062,968

CLASS 211

12 5,062,533
48 5,062,534
162 5,062,535
5,062,536

CLASS 215

12.1 5,062,537
260 5,062,538

CLASS 219

86.1 5,063,278
86.51 5,063,279
121.7 5,063,280
125.12 5,063,281
130.51 5,063,282
218 5,063,283
497 5,063,284

CLASS 220

4.27 5,062,539
23.83 5,062,540
212 5,062,541
269 5,062,542

CLASS 221

30 5,062,543
130 5,062,544
152 5,062,545

CLASS 222

3 5,062,546
80 5,062,550
144.5 5,062,547
190 5,062,548
377 5,062,549
390 5,062,551
570 5,062,552
590 5,062,553
600 5,062,554
641 5,062,555

CLASS 223

96 5,062,556

CLASS 224

148 5,062,591
153 5,062,557
270 5,062,558
311 5,062,559
328 5,062,560

CLASS 226

152 5,062,561

CLASS 227

111 5,062,562
176 5,062,563

CLASS 228

9 5,062,564
5,062,565
102 5,062,566
105 5,062,567

CLASS 229

1.5 B 5,062,568
3.5 R 5,062,569
71 5,062,570
117 5,062,527

CLASS 235

114 5,063,285

CLASS 236

43 A 5,062,571

CLASS 239

533.12 5,062,573
899 5,062,572

CLASS 241

22 5,062,574
73 5,062,575
79.3 5,062,601
167 5,062,576
171 5,062,577

CLASS 242

3 5,062,578
56.4 5,062,582
68.3 5,062,579
125.2 5,062,580
129.6 5,062,581

CLASS 244

3.12 5,062,586
3.15 5,062,583
5,062,584
3.24 5,062,585
7 B 5,062,587
23 D 5,062,588
117 R 5,062,589
118.5 5,062,590
164 5,062,592
169 5,062,593
175 5,062,594
214 5,062,595
234 5,062,596

CLASS 248

27.1 5,062,604
68.1 5,062,605
171 5,062,606
211 5,062,607
289.1 5,062,608
676 5,062,609

CLASS 249

52 5,062,610

CLASS 250

208.1 5,063,286
214 AG 5,063,287
221 5,063,288
5,063,289
227.17 5,063,290
231.14 5,063,295
231.16 5,063,291
236 5,063,292
308 5,063,293
309 5,063,294
343 5,063,275
396 ML 5,063,296
458.1 5,063,297
497.1 5,063,298
507.1 5,063,299
561 5,063,300
574 5,063,301

CLASS 251

129.11 5,062,611

CLASS 252

8.551 5,062,969
8.554 5,062,970
8.6 5,062,971
8.75 5,062,973
8.8 5,062,972
11 5,062,974
33 5,062,975
45 5,062,976
48.2 5,062,977
49.3 5,062,978
5,062,979
51.5 A 5,062,980
62.54 5,062,981
62.57 5,062,982
5,062,983
67 5,062,985
134 5,062,986
156 5,062,987
170 5,062,988
174.17 5,062,989
299.61 5,062,990
315.2 5,062,991
394 5,062,992
545 5,062,994
546 5,062,995
610 5,062,996

CLASS 256

11 5,062,612

CLASS 257

518 5,062,993

CLASS 260

400 5,062,997
403 B1 4,229,360
665 R 5,062,998

CLASS 261

39.1 5,062,999
94 5,063,000

CLASS 264

0.5 5,063,001
12 5,063,002
14 5,063,003
22 5,063,004
5,063,005
35 5,063,006
40.5 5,063,008
44 5,063,007
49 5,063,009
109 5,063,010
126 5,063,011
129 5,063,012
151 5,063,014
161 5,063,015
211.21 5,063,016
328.6 5,063,017
514 5,063,018

CLASS 266

44 5,062,613
216 5,062,614
217 5,062,615

CLASS 267

64.17 5,062,616
132 5,062,617
140.4 5,062,618
154 5,062,619
260 5,062,620

CLASS 269

136 5,063,013
305 5,062,621

CLASS 270

39 5,062,597

CLASS 271

6 5,062,598
35 5,062,599
5,062,600
104 5,062,602
195 5,062,603
270 5,062,622
283 5,062,623

CLASS 272

1 R 5,062,624
67 5,062,625
69 5,062,626
70 5,062,627
75 5,062,628
97 5,062,629
111 5,062,630
123 5,062,631
129 5,062,632
132 5,062,633

CLASS 273

67 R 5,062,634
68 5,062,636
80 R Re.33,735
144 A 5,062,635
157 R 5,062,637
167 R 5,062,638
171 5,062,639
176 F 5,062,640
181 C 5,062,641
183 B 5,062,642
188 A 5,062,643
232 5,062,644
249 5,062,645
411 5,062,646
442 5,062,647

CLASS 277

112 5,062,648
235 B 5,062,649

CLASS 280

1.5 5,062,651
64 5,062,652
648 5,062,653
673 5,062,654
674 5,062,655
689 5,062,656
707 5,062,657
5,062,658
5,062,659
5,062,660
731 5,062,661
733 5,062,662
743 5,062,663
5,062,664
770 5,062,665

CLASS 283

67 5,062,666

CLASS 285

381 5,062,667

CLASS 292

25 5,062,668
60 5,062,669
137 5,062,670
175 5,062,671

CLASS 294

65.5 5,062,672
111 5,062,673
143 5,062,674

CLASS 296

1.1 5,062,675

CLASS 297

129 5,062,650
338 5,062,676
444 5,062,677

CLASS 307

271 5,063,302
296.1 5,063,303
296.6 5,063,304
304 5,063,305
308 5,063,306
310 5,063,307
443 5,063,308
521 5,063,309
570 5,063,310
603 5,063,311
5,063,312
605 5,063,313

CLASS 310

71 5,063,314
5,063,315
83 5,063,316
91 5,063,317
156 5,063,318
210 5,063,319
270 5,063,320
323 5,063,321
341 5,063,322

CLASS 312

221 5,062,678

CLASS 313

309 5,063,323
346 DC 5,063,324
405 5,063,325
414 5,063,326
482 5,063,327

CLASS 315

96 5,063,328
111.21 5,063,329
5,063,330
219 5,063,331
248 5,063,332
326 5,063,333

CLASS 318

568.10 5,063,334
609 5,063,335
611 5,063,336
617 5,063,337
685 5,063,338
696 5,063,339

CLASS 320

1 5,063,340
21 5,063,341

CLASS 323

315 5,063,342
317 5,063,343

CLASS 324

115 5,063,344
173 5,063,345
5,063,346
235 5,063,347
307 5,063,348
322 5,063,349
457 5,063,350
628 5,063,351
706 5,063,352
710 5,063,353

CLASS 328

14 5,063,354
129.1 5,063,355

CLASS 330

306 5,063,356

CLASS 331

49 5,063,357
60 5,063,358
116 FE 5,063,359
175 5,063,360

CLASS 332

103 5,063,361

CLASS 333

12 5,063,362
33 5,063,363
107 5,063,364
121 5,063,365

CLASS 335

210 Re.33,736
271 5,063,366
284 5,063,367
301 5,063,368

CLASS 340

429 5,063,369
540 5,063,370
541 5,063,371
547 5,063,372
573 5,063,373
642 5,063,374
703 5,063,375
706 5,063,376
764 5,063,377
784 5,063,378
5,063,379
825.54 5,063,380
984 5,063,381

CLASS 341

15 5,063,382
120 5,063,383

CLASS 342

1 5,063,384
13 5,063,385
40 5,063,386
103 5,063,387
185 5,063,388
359 5,063,389
375 5,063,390

CLASS 343

703 5,063,391

CLASS 346

46 5,063,392
75 5,063,393
76 PH 5,063,394
5,063,395
140 R 5,063,396
143 5,063,451
153.1 5,063,397
157 5,063,398
160.1 5,063,399

CLASS 350

96.23 5,062,685
96.30 5,062,687

CLASS 351

160 R 5,062,701
212 5,062,702

CLASS 354

288 5,063,400
320 5,063,401
400 5,063,402
413 5,063,403

CLASS 355

30 5,063,404
32 5,063,405
57 5,063,406
68 5,063,407
72 5,063,408
200 5,063,409
204 5,063,410
212 5,063,411
259 5,063,412
296 5,063,413
5,063,414
312 5,063,415
316 5,063,416

CLASS 356

73.1 5,062,703
5,062,704
124 5,062,705
246 5,062,706
311 5,062,707
316 5,062,708
335 5,062,709
350 5,062,710
394 5,062,711
400 5,062,712
402 5,062,713
406 5,062,714
432 5,062,715

CLASS 357

8 5,063,417
15 5,063,418
16 5,063,419
17 5,063,420
5,063,421
23.3 5,063,422
23.5 5,063,423
5,063,424
23.6 5,063,425
30 5,063,426
35 5,063,427
38 5,063,428
40 5,063,429
45 5,063,430
54 5,063,431
70 5,063,432
71 5,063,433
72 5,063,434
74 5,063,435
79 5,063,436

CLASS 358

22 5,063,437
31 5,063,438
41 5,063,439
85 5,063,440
88 5,063,441
93 5,063,442
133 5,063,443
5,063,444
138 5,063,445
142 5,063,446
145 5,063,447
160 5,063,448
213.11 5,063,449
213.28 5,063,450
310 5,063,456
330 5,063,457
335 5,063,458
404 5,063,459
474 5,063,460
5,063,461
475 5,063,462

CLASS 359

45 5,062,692
56 5,062,691
59 5,062,690
127 5,063,559
206 5,062,679
230 5,062,689
241 5,062,693
379 5,062,697
414 5,062,698
430 5,062,699
498 5,062,694
508 5,062,700
554 5,062,696
619 5,062,688
689 5,062,695

CLASS 360

19.1 5,063,452
32 5,063,453
78.04 5,063,454
96.5 5,063,455
5,063,463
104 5,063,464
5,063,465
107 5,063,466
119 5,063,467
123 5,063,468
128 5,063,469
137 5,063,470

CLASS 361

18 5,063,471
19 5,063,472
93 5,063,473
220 5,063,474
384 5,063,475
5,063,476
5,063,477
405 5,063,478

CLASS 362

32 5,063,479
61 5,063,480
5,063,481
66 5,063,482
103 5,063,483
109 5,063,484
122 5,063,485
217 5,063,486

CLASS 363

3 5,063,487
16 5,063,488
21 5,063,489
37 5,063,490
56 5,063,491

CLASS 364

167.01 5,063,492
192 5,063,493
400 5,063,505
402 5,063,506
408 5,063,507
419 5,063,508
5,063,534
420 5,063,509
424.05 5,063,512
5,063,513
424.1 5,063,510
5,063,511
426.02 5,063,514
431.01 5,063,515
431.11 5,063,516
474.22 5,063,517
503 5,063,518
510 5,063,519
512 5,063,520
514 5,063,523
516 5,063,524
550 5,063,527
559 5,063,528
571.02 5,063,529
748 5,063,530
825 5,063,532

CLASS 365

96 5,063,537
106 5,063,538
145 5,063,539
175 5,063,540

CLASS 367

7 5,063,541
166 5,063,542

CLASS 368

29 5,063,543
74 5,063,544

CLASS 369

32 5,063,545
5,063,546
5,063,547
44.14 5,063,548
44.28 5,063,549
44.36 5,063,550
48 5,063,551
50 5,063,552
77.1 5,063,553
77.2 5,063,554
97 5,063,555
112 5,063,556
219 5,063,557
291 5,063,558

CLASS 370

18 5,063,560
85.2 5,063,561
94.1 5,063,562
110.1 5,063,563
5,063,564

CLASS 371

40.2 5,063,565

CLASS 372

22 5,063,566
28 5,063,567
32 5,063,568
45 5,063,569
50 5,063,570

CLASS 375

1 5,063,571
5,063,572
14 5,063,573
27 5,063,574
108 5,063,575
111 5,063,576
120 5,063,577

CLASS 376

331 5,063,019
371 5,063,020

CLASS 377

47 5,063,578
48 5,063,579
55 5,063,580
58 5,063,581

CLASS 378

34 5,063,582
5,063,586
207 5,063,583

CLASS 379

29 5,063,584
30 5,063,585
53 5,063,587
57 5,063,588
82 5,063,589
99 5,063,590
115 5,063,591
207 5,063,592
386 5,063,593

CLASS 380

15 5,063,594
48 5,063,595
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CLASS 381

47 5,063,597
71 5,063,598

CLASS 382

7 5,063,599
13 5,063,600
14 5,063,601
32 5,063,602
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41 5,063,604
44 5,063,605
48 5,063,606
50 5,063,607
56 5,063,608

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9 5,062,716
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294 5,062,718
450 5,062,719
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536 5,062,721

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85 5,062,682
87 5,062,683
131 5,062,680
141 Re.33,737

CLASS 392

401 5,063,609

CLASS 395

25 5,063,531
27 5,063,521
51 5,063,522
155 5,063,526
157 5,063,525
200 5,063,500
425 5,063,498
5,063,533
500 5,063,499
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725 5,063,501
5,063,502
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5,063,504
775 5,063,536
800 5,063,494
5,063,497

CLASS 400

120 5,062,722
5,062,723
121 5,062,724
195 5,062,725
630 5,062,726

CLASS 401

52 5,062,727
176 5,062,728
287 5,062,729

CLASS 403

57 5,062,730
96 5,062,731
174 5,062,732
189 5,062,733
313 5,062,734

CLASS 404

25 5,062,735
72 5,062,736
98 5,062,737
114 5,062,738

CLASS 405

21 5,062,739
270 5,062,740

CLASS 406

76 5,062,741

CLASS 407

28 5,062,742

CLASS 408

6 5,062,743
8 5,062,744
17 5,062,745
79 5,062,746
115 R 5,062,747
206 5,062,748
240 5,062,749

CLASS 409

132 5,062,750

CLASS 410

154 5,062,751

CLASS 411

347 5,062,752
470 5,062,753

CLASS 412

4 5,062,754

CLASS 414

5,062,755
22.51 5,062,756
24.5 5,062,757
217 5,062,758
408 5,062,759
542 5,062,760
729 5,062,761
786 5,062,762
787 5,062,763
796 5,062,764

CLASS 415

4.3 5,062,765
199.1 5,062,766
209.3 5,062,767

CLASS 416

97 R 5,062,768
217 5,062,769

CLASS 417

46 5,062,770
201 5,062,771
269 5,062,772
5,062,773
413 5,062,774
477 5,062,775

CLASS 418

61.3 5,062,776
104 5,062,777
220 5,062,778
270 5,062,779

CLASS 419

12 5,063,021
49 5,063,022

CLASS 420

442 5,063,023

CLASS 421

64 5,063,096

CLASS 422

65 5,063,024
82.07 5,063,178
100 5,063,025
102 5,063,026
133 5,063,027
144 5,063,028
175 5,063,029
189 5,063,030
245 5,063,031

CLASS 423

84 5,063,032
112 5,063,033
235 5,063,034
241 5,063,035
266 5,063,036
277 5,063,037
328 5,063,038
329 5,063,039
342 5,063,040
447.4 5,063,042
476 5,063,041
588 5,063,043

CLASS 424

9 5,063,045
52 5,063,046
59 5,063,048
61 5,063,049
63 5,063,050
70 5,063,044
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89 5,063,053
92 5,063,054
93 5,063,055
401 5,063,056
5,063,057
405 5,063,058
408 5,063,059
422 5,063,060
427 5,063,061
443 5,063,062
445 5,063,063
637 5,063,065
673 5,063,064

CLASS 425

39 5,062,780
52 5,062,781
113 5,062,782
115 5,062,783
143 5,062,784
145 5,062,785
174 5,062,786
522 5,062,787

CLASS 426

2 5,063,066
69 5,063,067
94 5,063,068
122 5,063,069
271 5,063,070
298 5,063,071
557 5,063,072
573 5,063,073
585 5,063,074
601 5,063,075
602 5,063,076
614 5,063,077
618 5,063,078
627 5,063,079
660 5,063,080

CLASS 427

2 5,063,081
5,063,082
53.1 5,063,083
154 5,063,084
240 5,063,085
255.3 5,063,086
302 5,063,087
352 5,063,088
354 5,063,089
384 5,063,090
385.5 5,063,091
393 5,063,092

CLASS 428

15 5,063,093
35.7 5,063,094
35.8 5,063,095
65 5,063,097
76 5,063,098
109 5,063,099
137 5,063,100
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172 5,063,101
209 5,063,102
285 5,063,103
286 5,063,104
336 5,063,105
343 5,063,106
367 5,063,107
369 5,063,108
378 5,063,109
402 5,063,110
411.1 5,063,111
412 5,063,112
446 5,063,113
447 5,063,114
5,063,115
606 5,063,116
610 5,063,117
614 5,063,118
694 5,063,119
5,063,120
698 5,063,121

CLASS 429

32 5,063,122
38 5,063,123
192 5,063,124

CLASS 430

45 5,063,127
59 5,063,125
5,063,126
63 5,063,128
83 5,063,129
109 5,063,132
122 5,063,133
192 5,063,134
214 5,063,135
248 5,063,136
292 5,063,137
326 5,063,138
372 5,063,131
377 5,063,139
393 5,063,140
398 5,063,141
400 5,063,142
419 5,063,143
436 5,063,144
505 5,063,145
522 5,063,146
523 5,063,147
551 5,063,148

CLASS 431

7 5,062,788
9 5,062,789
114 5,062,790
266 5,062,791
284 5,062,792

CLASS 433

3 5,062,793
10 5,062,794
80 5,062,795
82 5,062,796
118 5,062,797
201.1 5,062,798
215 5,062,799
229 5,062,800

CLASS 435

4 5,063,149
5 5,063,150
7.33 5,063,151
24 5,063,152
26 5,063,153
69.1 5,063,154
76 5,063,155
150 5,063,156
240.2 5,063,157
252.3 5,063,158
5,063,159
252.5 5,063,161
253.3 5,063,160
270 5,063,162

CLASS 436

94 5,063,163
169 5,063,164
500 5,063,165

CLASS 437

22 5,063,166
31 5,063,167
5,063,168
41 5,063,169
5,063,170
5,063,171
43 5,063,172
129 5,063,173
184 5,063,174
192 5,063,175
195 5,063,176
209 5,063,177

CLASS 439

61 5,062,801
72 5,062,802
96 5,063,130
160 5,062,803
394 5,062,804
404 5,062,805
490 5,062,806
5,062,807
580 5,062,808
581 5,062,809
589 5,062,810
620 5,062,811
756 5,062,812
857 5,062,813

CLASS 440

31 5,062,814
41 5,062,815
101 5,062,816

CLASS 441

45 5,062,817

CLASS 445

22 5,062,818

CLASS 446

462 5,062,819

CLASS 452

187 5,062,820

CLASS 455

45 5,063,610
348 5,063,611
607 5,063,612

CLASS 464

111 5,062,821

CLASS 475

200 5,062,822
330 5,062,823
342 5,062,824

CLASS 493

194 5,062,825

CLASS 494

85 5,062,826

CLASS 501

12 5,063,179
38 5,063,180
54 5,063,181
96 5,063,182
5,063,183
5,063,184
126 5,063,185

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4 5,063,186
71 5,063,187
116 5,063,188
150 5,063,189
157 5,063,190
174 5,063,191
303 5,063,192
304 5,063,193
314 5,063,194
341 5,063,195
417 5,063,196

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227 5,063,198

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5,063,200
5,063,201
5,063,202

CLASS 514

8 5,063,203
5,063,204

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12	5,063,205	213	5,063,230	585	5,063,247	213	5,063,260		CLASS 574		CLASS 606
16	5,063,206	214	5,063,231	665	5,063,248	402	5,063,261	253	5,063,228	3	5,062,842
18	5,063,207	247	5,063,232	673	5,063,249		CLASS 524		CLASS 604	53	5,062,843
19	5,063,208	251	5,063,226		CLASS 518	97	5,063,262	22	5,062,827	54	5,062,844
44	5,063,209	252	5,063,227	704	5,063,250	101	5,063,263	51	5,062,828	80	5,062,845
54	5,063,210	258	5,063,229		CLASS 521	118	5,063,264	57	5,062,829	158	5,062,846
75	5,063,211	266	5,063,233	84.1	5,063,251	126	5,063,265	68	5,062,830	194	5,062,847
	5,063,212	288	5,063,234	108	5,063,252	269	5,063,266	104	5,062,831	213	5,062,848
	5,063,213	317	5,063,235	159	5,063,253	284	5,063,267	110	5,062,832		CLASS 623
	5,063,214	318	5,063,236		CLASS 522	286	5,063,268		5,062,833	16	5,062,849
	5,063,215	338	5,063,237	43	5,063,254	296	5,063,269	143	5,062,834	17	5,062,850
	5,063,216	340	5,063,238	96	5,063,255	306	5,063,270	153	5,062,835	18	5,062,851
	5,063,217	357	5,063,239		CLASS 523	351	5,063,271	167	5,062,836	20	5,062,852
	5,063,218	369	5,063,240	102	5,063,256	377	5,063,272	240	5,062,837	22	5,062,853
157	5,063,219	383	5,063,241	116	5,063,257		CLASS 525	366	5,062,838	23	5,062,854
161	5,063,220	404	5,063,245	171	5,063,258	67	5,062,984	385.1	5,062,839	24	5,062,855
167	5,063,221	414	5,063,242	201	5,063,259			891.1	5,062,840		5,062,856
180	5,063,222	438	5,063,243						5,062,841	25	5,062,857
185	5,063,223	456	5,063,244							43	5,062,858
202	5,063,224	517	5,063,246							55	5,062,859
211	5,063,225	538	B1 4,835,182							63	5,062,860

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D1—	106	321,270		461	321,296		415	321,323		141	321,348		42	321,374	D24—	140	321,400
	107	321,271		495	321,297		425	321,324		223	321,350	D21—	13	321,375		147	321,401
	109	321,272			321,298		435	321,325		251	321,351			321,376		188	321,402
D2—	24	321,273		498	321,299		438	321,326	D15—	7	321,352			321,377	D25—	52	321,403
	248	321,274		511	321,300	D10—	33	321,327		69	321,353		30	321,378	D26—	2	321,404
	320	321,275	D7—	376	321,301		46.2	321,328		70	321,354		57	321,379		65	321,405
	605	321,276		392.1	321,302		104	321,329		150	321,309		71	321,380		67	321,406
D3—	26	321,277		607	321,306		106	321,330	D16—	102	321,355		105	321,381		72	321,407
	35	321,279		688	321,303	D11—	43	321,331			321,356		120	321,382		85	321,408
	36	321,278		691	321,304		164	321,332		107	321,357		123	321,383		91	321,409
		321,280			321,305		221	321,333		211	321,358		142	321,384		138	321,410
	38	321,281	D8—	14	321,307	D12—	114	321,334		219	321,359		148	321,385	D28—	17	321,411
	39	321,282			321,308		131	321,335		229	321,360		191	321,386		35	321,412
	74	321,283		22	321,310		192	321,336		235	321,361		195	321,387		51	321,413
	75	321,284			321,311	D13—	108	321,337	D18—	15	321,365			321,388		56	321,414
D4—	101	321,285		339	321,312			321,338		24	321,366			321,389		80	321,415
	104	321,286		370	321,313		160	321,339		25	321,367			321,390		83	321,416
	106	321,287		373	321,314	D14—	100	321,340		34	321,368			321,391	D29—	2	321,417
D6—	315	321,288	D9—	300	321,315		102	321,341		49	321,362		201	321,392		7	321,418
	361	321,289		307	321,316		107	321,342		54	321,363		226	321,393		8	321,419
	367	321,290		337	321,317			321,343		55	321,364	D23—	209	321,394	D32—	15	321,420
	407	321,291		352	321,318		113	321,344	D19—	26	321,369		216	321,395		41	321,421
	417	321,292		366	321,319			321,345		62	321,370			321,396		46	321,422
	419	321,293			321,320		129	321,346		77	321,371		238	321,397		58	321,423
	434	321,294		375	321,321		138	321,347		90	321,372		241	321,398			
	444	321,295			321,322			321,349	D20—	11	321,373		277	321,399	D34—	21	321,424

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DESIGN PATENTS

01 :	321,313		321,366	18 :	321,297		321,309		321,357		321,404
06 :	321,280		321,371		321,298	27 :	321,393		321,358	44 :	321,284
	321,291		321,402		321,367		321,401		321,369		321,302
	321,303		321,419	20 :	321,379	28 :	321,292	37 :	321,282		321,381
	321,327	13 :	321,294		321,403	32 :	321,385		321,344		321,400
	321,334		321,414		321,418	34 :	321,270		321,370	47 :	321,307
	321,341		321,417	21 :	321,288		321,271	39 :	321,289	48 :	321,277
	321,348	17 :	321,276		321,345		321,272		321,321		321,308
	321,365		321,283		321,387		321,274		321,322		321,314
	321,372		321,296		321,389		321,293		321,343		321,318
	321,378		321,299		321,390		321,346		321,406		321,336
	321,422		321,301		321,391		321,355		321,408		321,412
08 :	321,420		321,332	23 :	321,333	36 :	321,286	41 :	321,421	49 :	321,388
09 :	321,279		321,339	24 :	321,273		321,304		321,424	50 :	321,380
	321,300		321,368		321,373		321,305	42 :	321,290	51 :	321,312
	321,394		321,395	25 :	321,275		321,317		321,324	53 :	321,278
	321,405		321,396		321,382		321,325		321,374		321,306
12 :	321,329		321,410	26 :	321,287		321,331		321,386	55 :	321,397
	321,340										

PLANT PATENTS

06 :	7,700		7,703	08 :	7,702						

STATUTORY INVENTION REGISTRATIONS

01 :	H980		H994		H989		H993	42 :	H978		H988
06 :	H975		H997	24 :	H976	36 :	H986	48 :	H977		H996
	H981	17 :	H984		H990		H992		H982		
	H991		H987	34 :	H985	39 :	H979		H983	51 :	H995

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